United Nations
A/53/662

General Assembly

Distr.: General
11 November 1998

Original: English

Fifty-third session
Agenda item 113
Programme budget for the biennium 1998–1999

Integrated Management Information System project

Note by the Secretary-General

I have the honour to transmit herewith to the members of the General Assembly, pursuant to paragraph 12 of General Assembly resolution 52/227 of 31 March 1998, the forward-looking study of the Integrated Management Information System conducted by independent experts.

IMIS
Independent Experts Study

Prepared for
The United Nations

by
Dr. Miguel Brucher, Brazil & Mr. Colin Wooles, Canada

Table of Contents

Forward

Executive Summary

1 The IMIS Environment 1
- 1.1 The Goals of IMIS 1
  - 1.1.1 The Rationale for the Project Initiation 1
  - 1.1.2 Design Objectives 3
  - 1.1.3 Integration Design Principles 5
  - 1.1.4 Situational Goals 5
- 1.2 IM/IT Management at the United Nations 6
  - 1.2.1 A Decentralized Approach 6
  - 1.2.2 Roles of ITSD 7
  - 1.2.3 IMIS Project 8
  - 1.2.4 IT Expertise Resident with IMIS End Users 8

2 Management of the IMIS Project 11
- 2.1 IMIS Governance 11
- 2.2 IMIS Project Team 12
- 2.3 IMIS Prime Contractor 14
- 2.4 IMIS Costs 15
  - 2.4.1 Direct Project Costs 15
  - 2.4.2 Indirect Costs 16

3 IMIS Development and Implementation 17
- 3.1 Truly Integrated Functional Design 17
- 3.2 Phased Release Plan 20
- 3.3 Human Resources Management at Headquarters 21
- 3.4 Human Resources Management at OAHs 25
- 3.5 Human Resources Management at UNDP, UNICEF and ILO 25
- 3.6 Staff Entitlements 26
- 3.7 Finance and Support Services 28
- 3.8 Technical Cooperation 30
- 3.9 Payroll 30
- 3.10 Leave and Attendance 31
- 3.11 Insurance 31
- 3.11 Treasury 31
- 3.13 Travel 32
- 3.14 Security and Control 32

3.15 Success of Usage at Headquarters 33
3.16 Substantive Benefits and Improvements Realized 36
3.17 IMIS Data Retrieval and Reporting 36

4 Infrastructure and Data Communications 41
4.1 Technical Architecture 41
4.2 Data Communications 43
4.3 Remote Connectivity and Access 44
    4.3.1 The Issue 44
    4.3.2 IMIS WEB prototype 46
    4.3.3 Other Technical Opportunities 46
    4.3.4 Challenges to Successful Development of the Remote Access Capabilities 46

5 IMIS Maintenance Requirements 49
5.1 Following through on Previous UN Studies 49
5.2 Issues to be Managed 50
5.3 Scope of IMIS Maintenance Activities 52
5.4 Organizing for IMIS Maintenance 54
5.5 Performance Targets 55
5.6 Guidelines for Determining Staffing Levels 56
    5.6.1 Central IMIS Maintenance Unit 56
    5.6.2 Transitional Maintenance Strategy 57
    5.6.3 System Administration and Network Support Unit (within ITSD) 58
    5.6.4 Policy and Systems Units (within OPPBA, OHRM, OCSS) 59
    5.6.5 Training Unit (within OHRM) 60
    5.6.6 Minimum staffing needs for OAHs 60
    5.6.7 Summary of UN Organizational IMIS Maintenance Requirements 60
    5.6.8 Guidelines for Maintenance Responsibilities 61
5.7 Inter-Agency Governance Framework 61
    5.7.1 Several Players at the Table 61
    5.7.2 Formal Participation of Inter-Agency Substantive Forums 61
    5.7.3 Termination of the Prime Contractor Participation 62
    5.7.4 Common Service in support of announced UN Reforms 62
    5.7.5 Field Office Version of IMIS 63
    5.7.6 A Governance Concept 63

6 Conclusions and Recommendations 67
6.1 Conclusions 67
    6.1.1 Project Accomplishments 67
    6.1.2 Project Investments 69
    6.1.3 Technologies Deployed 70
    6.1.4 Lessons Learned 71
6.2 Recommendations 73
    6.2.1 Implementation of IMIS at OAHs 73
    6.2.2 Long Term Maintenance 75
    6.2.3 Inter-Agency Governance Framework 76

6.2.4 Data Communications 77
6.2.5 Remote Connectivity in Support of Peacekeeping and Tribunals 77
6.2.6 UN Secretariat IMIS Management Process 78

Annexes

I Study Consultations

II Project Team: Specialties and Expertise

III Documents Processed Volumes June 1998

IV Substantive Benefits and Improvements Realized

V Production IMIS Upgrade Report July 1998

VI Maintenance Responsibilities

About the Experts

Foreword

The General Assembly resolution concerning the Integrated Management Information System (IMIS), A/RES/52/227 22 April 1998, requested the Secretary-General to have a forward-looking study of the system conducted by independent experts. The requested purpose of the independent study is:

a) to assess the system from a technical point of view both in terms of design and operations taking into account the specific requirements of the United Nations;

b) to advise on the long term maintenance and operational requirements of the system in terms of the number and qualifications of staff, infrastructure and communications; and

c) to advise on possible strategies for improving the system and optimize maintenance costs.

In light of this request the IMIS Project Steering Committee engaged the services of two independent experts with diverse backgrounds in information management and information technologies (IM/IT) planning, development and implementation focussed in the government and international institutional sectors. The experts were Dr. Miguel Brucher from Brazil and Mr. Colin Wooles from Canada. The curriculum vitae of the experts are given following the annexes to the report.

The study was conducted in July 1998. In keeping with the terms of reference set by the General Assembly, a management consultation approach was used, as opposed to an audit approach. The methodology employed for the study was: consult with involved senior officials and user management stakeholders in the Department of Management and UNDP; meet with a group of IMIS users from executive offices; meet with the senior members of the IMIS project team and attend a series of functional and technical demonstrations of IMIS; review project related documents and files; and, gather additional information relevant to the engagement. A list of officials consulted is given at Annex I.

Executive Summary

In this study we have covered all three areas which were requested by the General Assembly (please refer to the Forward preceding for the specific terms of reference). In this report we elaborate on the successful accomplishments of the project, the values returned for the levels of investment made, the plans for the immediate future, and, options for future directions. At the same time, in our examination of the project development and implementation history, status and plans we have found areas where good management practices were not followed. These items have also been detailed in our report, sometimes with an elaboration on the root causes of such problems, in order that the General Assembly and the Administration as a whole may benefit from the lessons learned.

This executive summary describes our overall findings and conclusions, and, the recommendations which we make. The lines of inquiry we took during the study, detailed information substantiating the conclusions, and the circumstances supporting the recommendations are contained in the body of the report.

Implementation History and Plans

The overall purpose of the Integrated Information Management System (IMIS), which was approved by the General Assembly in December 1988, is to develop an integrated system for the processing of, and reporting on, administrative actions at all duty stations. Although initially envisioned and funded specifically for the UN, its potential for use in other UN organizations has been recognized and implementation of the system has occurred to date not only in the UN in New York and the seven major duty stations but also in UNDP, UNICEF and ILO.

The IMIS application is being implemented in five major stages, or releases as they are known. Following the phased release strategy the functionalities of IMIS have been progressively installed, not without extreme difficulties and with severe slippage from earlier expectations, since 1993. The first release, Human Resources Management, has also been installed at the seven Offices Away from Headquarters (OAHs); these installations were made over the period 1996-through 1998. Installation in Beirut was deferred pending completion of the move of ESCWA to Beirut.

The chart on the page 26 shows the schedule of releases and the planned schedule for roll-out completion which is as much as possible targeted for 1999 in order to mitigate the Year 2000 problem at all locations. However, at the present time the schedule for some roll-out activities has yet to be decided.

It is critical to all of the OAHs that IMIS Release 3 (Finance & Support Services) be working at those locations in 1999. This is because of the Year 2000 problem and the almost certainty that many of the existing administrative, human resources and financial computer systems at some locations are not programmed to work properly in the year 2000. The expectation has always been that IMIS software, which is Year 2000 compliant, will have been installed and will have replaced the existing legacy systems prior to the year 2000 arrival.

Installation at some of the overseas duty stations was complicated by the logistics of getting the computer equipment to the duty stations and getting it installed by the regional representatives of the equipment vendor. Delays were experienced but the installations were eventually completed successfully. The situation will not arise for future releases of IMIS as the hardware is already in place and operating.

IMIS is a well designed and robust computer application which is providing functional support to a large number of users in New York at the UN, UNDP, UNFPA, ONOPS and UNICEF, and, at the ITC in Geneva. At the OAHs and ILO the application is not presently as advanced as New York in its implementation. The system is used satisfactorily by a large number of users with differing substantive interests. In excess of 400 different users access IMIS at the UN in New York each day, and at peak times there are in the order of 300 concurrent users. The body of the report shows examples of the usage levels in New York.

IMIS has been successfully integrated with commercially available software for use in specific areas, such as procurement, investment portfolio management, cheque writing and direct funds transfer. The judicious use of packaged functional solutions has reduced development time and costs.

Implementing IMIS has been a difficult process within the UN Secretariat The organization has overcome many barriers toward a successful implementation. The most prominent hurdle which has been overcome is the lack of available resources on the development team and in the user arenas. For all of the major releases, the UN had few resources to participate in the user testing and subsequently the loading of the data. This was due to the increased demands on the Administration to provide support to Peacekeeping missions away from headquarters throughout the 1990's and the series of staff reductions which the organization went through. The situation was that when the computer system releases were ready to be used the primary user organizations had few resources to adequately test the system and to load the data.

The lack of available substantive resources contributed to the extended and unanticipated implementation delays at Headquarters. Consequently the IMIS project used the prime contractor to provide assistance in data cleansing; this type of expenditure was never envisioned in the original project budget submission.

A major accomplishment is that IMIS has not failed like many similar IM/IT initiatives elsewhere. Many Member States can identify with project failures which have occurred within their countries. Industry research points to the fact that over the past decade failure has been as likely as success in large information systems projects development. Although the IMIS development process has been overwhelmingly long the final product, often after some false starts and disappointments when the software release is first delivered for testing and implementation, is a successful delivered working system for the releases made to date. Corrections to problems have progressively been made and users can cope with the present systems until all of the requested enhancements are made.

Funds Invested

The approved UN's development and implementation budget to date for IMIS is in the order of $68 million. Of this $42 million is for contractor services and $19 million is for staff assigned to the construction. These costs have been incurred since 1989. Based on our own experiences in management of the systems development process we find this level of investment reasonable for the outputs which have been produced. Many comparable IM/IT projects in the public and private sectors, both successful and failed, have cost far more than the budget of IMIS. Not many will have cost less.

Additional funds have been spent by UNDP, ILO and UNICEF on the development for and the implementation of IMIS in those organizations. The levels of funding spent by those organizations is far less than they would have had to pay to develop their own computer solutions or to implement some other commercial solutions. The UN's investment in IMIS, some $68 million, should be viewed in the context of the funding of a computer application for UN, UNDP, UNICEF and ILO. Cost avoidance to the UN family has been afforded by the initial UN investment in IMIS. Further savings can be realised should additional UN family organizations adopt IMIS as the basic platform for their business solutions.

Additional cost avoidance has been attained by using IMIS to circumvent having to make legacy systems Year 2000 compliant or to otherwise replace them at the UN, UNDP, ILO, UNICEF and the OAHs. We conservatively estimate such savings to collectively exceed millions of dollars for the human resources management, finance and accounting, and the various support services applications.

The legacy systems of the UN are in some instances 20 or 30 years old. The funds initially invested in those applications was well placed when the life of the application is considered. We are of the view that there are no reasons why IMIS should not have a useful life in excess of 15 years. Over such a period this would equate in simple terms to an annual investment of less than $5 million to provide the computer software to the full set of user organizations.

Technical Platform

We find that the IMIS technical architecture is well designed and that the production system is robust. Computer hardware is upgraded when required to meet the processing volumes of the various user organizations. The technologies used are widely used in the information technology industry.

Implementation at OAHs

We find that the implementation of finance and payroll at the OAHs before the Year 2000 is a major activity for which the OAHs and the IMIS project team are insufficiently prepared. In our opinion, some OAHs will fail to successfully implement the payroll release in 1999.

We recommend:

> *(Para. 275) the OAHs should make the existing legacy payroll systems Year 2000 compliant;*
>
> *(Para. 276) an IMIS Implementation Project Manager should be immediately appointed to focus on the detailed planning, scheduling, coordination and monitoring of IMIS implementation activities at OAHs. This person will be required to travel frequently to the OAHs to manage the implementation;*
>
> *(Para. 277) the OAHs, in consultation with the IMIS Implementation Project Manager and the IMIS project team, must prepare a detailed work plan with scheduled resource and funding requirements for the implementation of IMIS, and for a sustainable IMIS operations and coordination capability thereafter; and*
>
> *(Para. 278) accounting and systems implementation resources must be identified and/or recruited with some urgency and trained by the involved substantive offices and the IMIS project team to work on the implementation at OAHs.*

Long Term Maintenance

Each office or unit must prepare and effect staffing plans to meet its own substantive responsibilities and requirements for the operation, maintenance, continued development, sustainment and use of IMIS within their substantive theatre and for the appropriate management of those responsibilities.

The absolute definition of an appropriate long-term maintenance unit for IMIS cannot be undertaken at the present time, as such a process must be driven by a common service governance process for IMIS. The maintenance organization must be positioned and resourced to take into account the needs of all partners and stakeholders. In this respect, IMIS has progressed from being solely a UN Secretariat system to being one which is also used by UNDP, ILO and UNICEF.

A transitional maintenance strategy for the next 18 months has been given in the report body. This details the resources which are required in the IMIS project team to meet the known UN maintenance requirements. Additional funds and resources are required.

We recommend:

> *(Para. 282) the transitional maintenance strategy for placing the Central IMIS Maintenance Unit within the IMIS Project Team should be adopted until an Inter-Agency IMIS Governance Framework is in place;*
>
> *(Para. 283) the IMIS Project should be jointly funded to undertake the transitional maintenance strategy as detailed in chapter 5 plus any maintenance requirements funded by UNDP, UNICEF or ILO. This includes, as detailed in chapter 2 and particularly in section 5.6.2 , a level of up to four contractors may be required to supplement the IMIS team in light of the termination of the activities of the Prime Contractor; and*
>
> *(Para. 284) each UN Office and OAH should restructure to meet its own substantive IMIS operational, maintenance and coordination responsibilities as detailed in this report.*

Inter-Agency Governance Framework

Although the UN Secretariat was formerly the principal sponsor and champion of IMIS, and remains a major player, the participation of UNDP, ILO and UNICEF is recognized and must be formally respected as major players in influencing the future management and directions of IMIS. In chapter 5 we discuss the need to address the governance issue in order to finalize the long-term maintenance issues for IMIS. Our discussions consider the aspects of several players at the table, the need to ensure that there is a forum for substantive interests amongst the participating agencies to be collectively represented, the immediate urgency due to the pending termination of the Prime Contractor contract with the UN, opportunities for providing a common service in support of announced reforms (such as 'UN House'), and, the need to develop a field office version of IMIS to support multiple agencies and Peacekeeping Operations.

In chapter 5 we have suggested in diagrammatic form an organizational option for a long-term IMIS governance framework. This is centred on the notion of a United Nations IMIS Development Centre which operates under the direction of an Inter-Agency Governing Board and in conjunction with substantive Inter-Agency Advisory Groups.

We recommend:

> *(Para. 287) the Administration should work with other participating organizations to establish and fund an Inter-Agency Governance Framework for IMIS.*

Data Communications

The Organization still does not have an adequate data communications capability in place to facilitate the exchanges of IMIS data amongst Headquarters, the OAHs and the client organizations serviced by the OAHs. It is of the utmost priority that IMIS production data communications capabilities be in place when the data distribution software release is implemented in May 1999. These data communications capabilities are needed irrespective of IMIS.

A strategic alliance or supply arrangement with SITA (as used by UNICEF and UNDP) or a similar established service provider would prove to be advantageous to the UN. Points of delivery are currently at more than 1,200 world-wide locations. The opportunities this affords in light of the possible future global demands for UN assistance and intervention are many.

We recommend:

> *(Para. 290) the Administration should proceed with some urgency in providing a production data communications infrastructure for IMIS.*

Remote Connectivity in Support of Peacekeeping and Tribunals

With the development of activities worldwide, and the increased need of integrated databases to provide management with consolidated information on the status of resources and other activities, the reliance on several stand-alone systems at each peacekeeping mission has become insufficient. In addition, there is a growing need for allowing small locations to update data in a centralised system. The UN tribunals and other small offices are also trying to find solutions to their needs and small offices being installed at various duty stations away from the main duty stations (e.g. Bonn) cannot be provided with adequate system support.

The porting of IMIS to the world-wide WEB or the use of other remote access technologies is also of interest to IMIS user organizations that are more field oriented. UNDP has a similar need, ILO has expressed interest in this project and other agencies might become more interested in IMIS should this solution be available. The technology for the remote accessing of systems through the WEB and other technologies has progressed very rapidly over the past 12-18 months. The benefits which will accrue from the successful development of this capability are detailed in chapter 4.

We recommend:

(Para. 294) the General Assembly should approve funding expenditures for the development of a remote connectivity capability in IMIS to support Peacekeeping Operations, Tribunals, and the operations of other interested agencies.

UN Secretariat IMIS Management Process

IMIS is more than a computer system. For each user organization it is more importantly mission critical system which is accessible by authorized users and must be managed and maintained accordingly..

We advocate that substantive offices must take ownership and responsibility for ensuring that their substantive data is complete, accurate and timely, irrespective of which organizational units are involved in the collection, input and usage of the data. And, they must champion and prepare justifiable plans related to their substantive responsibilities for IMIS maintenance, operations and development. Ownership and accountability for the successful use of IMIS must be shared between the technical developers and the substantive authorities.

We recommend:

(Para. 298) the substantive IMIS status and plans, as articulated by each Office of the UN Secretariat and other IMIS user organizations, should be presented in the next IMIS progress report to the General Assembly.

1

1 The IMIS Environment

1.1 The Goals of IMIS

1.1.1 The Rationale for the Project Initiation

1. The overall purpose of the Integrated Information Management System (IMIS), which was approved by the General Assembly in December 1988, is to develop an integrated system for the processing of, and reporting on, administrative actions at all duty stations. Although initially envisioned and funded specifically for the UN, its potential for use in other UN organizations has been recognized and implementation of the system has occurred to date not only in the UN in New York and the seven duty stations but also in UNDP, UNICEF and ILO.

2. In the second half of the 1980's Member States undertook a comprehensive review of the UN's organizational business processes. The review led to recommendations for extensive reform in policies, systems and procedures in the areas of Human Resources Management, Finance and Accounts, Integrated Budgets and other administrative systems.

3. In performing its administrative functions, the United Nations operated without much of the sophisticated automation aids available in the late 1980s. Information systems development had not kept up with the state of the art or the needs of the Organization. In the area of administration and management, there were, at Headquarters alone, 22 independent computerized information systems. Many of these systems required the same data and therefore partially duplicated each other and overlapped. They provided limited support to the administrative functions of the Organization. They employed a level of data-processing sophistication widely used two decades previously. While efforts had been made over the years to improve and enhance them, the resources required to support and maintain these aged systems provided little or no return in automated assistance.

4. There was therefore widespread dissatisfaction with the existing data-processing systems that were meant to support the administrative functions of the organization, particularly in the financial and personnel areas. The systems very rarely shared common data; they were old and

unresponsive and, in some cases, there were no systems at all. In the area of staffing for example, there was no system which encompassed posts at all duty stations. Complete and current information on vacancies was therefore not available, nor could comprehensive statistical information be derived for planning and monitoring purposes. The functions pertaining to personnel administration were hampered by the lack of an accurate current incumbency table linking staff members, posts and job classifications. There was no central source of current personnel data. The then existing accounting system was not strong in serving the requirements of the central accounts function or the needs of programme managers for timely financial status reports. Cash receipt vouchers recorded in the treasury information-processing system had to be re-entered and reconciled in the general accounting system.

5. In addition to problems which are simply a result of the aging of the systems, there were problems attributable to the piecemeal development of systems designed to serve individual functional requirements and to meet particular needs without adequate regard to the benefits of integration. This situation extended beyond Headquarters to the systems installed in the overseas offices. At the United Nations Office at Geneva, for example, not only were the systems similar in characteristics and functionality to those operating at Headquarters, but they were, in certain cases, modified versions of those systems. The United Nations Office at Geneva operated and maintained its own versions of the Headquarters' accounting and payroll systems because the special requirements of the Office were not satisfied by the Headquarters systems, thereby incurring additional computer and staff costs.

6. This situation had serious repercussions throughout the Organization resulting in an ever increasing paper flow between the various offices and organizational units in the administrative areas in order to update each data base; additional human resource costs arising from multiple data entry in the various automated systems using identical data elements; inconsistent definitions of data elements often resulting from the proliferation of identical data elements in different applications; and the inability to respond in a timely fashion to necessary system changes as a result of the proliferation of applications. The problems were compounded by further fragmentation of administrative and management systems as various offices both at Headquarters and away from Headquarters had developed and installed their own local systems. This lack of integrated systems planning and development particularly affected the Organization in the area of administration and management where most information is interrelated and needs to be shared across organizational boundaries and among duty stations. At that time, 1988, the compilation of information for planning, management and decision-making was a lengthy, labour-intensive effort.

7. Responsibility for ensuring the provision of the administrative services needed to support the work programmes of the various substantive units rested with the relevant administrative units, be they executive offices in the larger departments at Headquarters, administrative offices in smaller departments and offices or divisions of administration at the regional commissions and other main duty stations away from Headquarters. These units initiated many of the staffing actions and financial transactions that are ultimately executed by the then Department of Administration and Management. They planned, received and managed allotments and initiated personnel actions,

travel, purchasing and other financial transactions. They were instrumental in the preparation of the medium-term plan and the programme budget. They managed posts and shared responsibility for the administration of staff members by means of personnel management authority delegated to them.

8. To perform their tasks, they required current data on the status of such key elements as obligations, expenditures, the staffing table, candidate rosters, procurement budgets and required staffing actions. In addition, because they initiated such a volume of transactions and correspondence, they required the facilities of good office automation and personal computer hardware/software for word-processing, storage of text and records, communication of data and text, downloading of mainframe data and data analysis. In theory, the data which they needed to perform their tasks should be available on computers for their review. In practice, the data were either not timely (for example, the status of the accounts or the post incumbency reports) or were available only in non-electronic formats (for example, travel transactions, personnel fact sheets or attendance records). These offices therefore individually automated their own files primarily on personal computers. They kept data for allotment control, staffing table control, the budget process, overtime control and even output control, as well as other functions. They maintained their own financial records in order to have up-to-date management information as accounting reports arrived too late to be of use for programme management purposes. A comprehensive integrated system was viewed as a necessary tool to eliminate the need for these individual systems and the activities associated with their maintenance and the reconciling of their data with central data.

9. In short, the administrative support systems in the United Nations in 1988 were fragmented and no longer served the needs of the Organization. What the Organization required was a consolidated, corporate data base of information which would be current, consistent and reliable, easily accessible and conducive to improved efficiency and productivity.

1.1.2 Design Objectives

10. The design of IMIS was based on the following objectives:

(a) The capture, on a more universally available and much more current basis than at present, of financial data which provide for good expenditure information and trend analysis;

(b) The development of a personnel system to expedite the processes performed by the Office of Human Resources Management with particular emphasis placed on the recruitment and placement processes, the need to develop and retain staff and the early identification and filling of vacancies;

(c) The provision of training to staff members to ensure that they are fully capable of using computer technology;

(d) The improvement of monitoring of programme implementation;

(e) The simplification of existing procedures, particularly in the personnel area, to increase efficiency and possibly eliminate some links in the existing chains of approval;

(f) Increased delegation of authority to, and greater accountability on the part of, executive and administrative Offices at all locations; and

(g) Efficient processing in a multi-location environment.

11. In addition, the following were identified to serve as guiding principles in the design and development of IMIS:

(a) it should incorporate modern design features, such as on-line updating and data retrieval, data base organization, user interfaces designed for ease of use and end-user programming taking advantage of high-level programming languages;

(b) it should produce efficiencies and facilitate improvements in management effectiveness;

(c) it should contain powerful and extensive administrative reporting capabilities, particularly for financial and personnel reporting and administrative data (financial, personnel, assets, procurement), all of which will be accessible for analysis to support management decision-making;

(d) it should maintain audit trails for all changes to financial and personnel records, must limit access to authorized staff only and must provide appropriate reporting and controls for audit purposes;

(e) it should be global in scope and modular in nature. That is, it should support administrative functions at overseas duty stations as well as at Headquarters and the technical environment of computing hardware, software and communications facilities must support efficient and effective communications between United Nations offices;

(f) it should be integrated; the technical environment should be compatible across subsystems and across duty stations; and

(g) it should be maintainable; it must be possible, with a modest effort, to ensure that changes and additions to subsystems respect the overall integrity, and that IMIS does not deteriorate over time.

1.1.3 Integration Design Principles

12. From the outset, IMIS design was based on the following principles:

(a) IMIS would be a fully integrated system;

(b) the IMIS data base would consist of various subject data bases which would be independent of any application area within IMIS. Data would be captured once and stored in single occurrences in the IMIS database;

(c) each IMIS application area would be on-line to the user community;

(d) IMIS would provide for extensive information reporting. Standard reports would be designed into the system and executed on demand by users. Information would also be displayed on screens as part of the system menus;

(e) IMIS would create electronic documents automatically as part of the on-line data entry processes as and when data become available. United Nations administrative forms and other printed records would be produced automatically by the IMIS system on request by the users;

(f) IMIS would provide for all levels of necessary security. Access to IMIS or any area thereof would be controlled through the use of identifiers and passwords. Data-base updating would be restricted to authorized users. IMIS would maintain tables of passwords, authorized users, etc. and record and report on attempts to breach security;

(g) IMIS would combine both text and data processing. The IMIS technology architecture would integrate data processing and office automation requirements;

(h) the IMIS technical architecture would consist of tools and techniques necessary both to meet the needs of the users and to support the development, operation and maintenance of the system; and

(i) all United Nations locations using IMIS would operate on compatible hardware and operating systems.

1.1.4 Situational Goals

13. In assessing the present situation we ascertained new goals, some implicit and others explicit, that must be attained or potential goals which may be desirable to various stakeholders in the UN family. Amongst these are the immediate goal to complete the presently planned roll-out of essential releases (entitlements and finance) to all duty stations in 1999 in order to avoid

catastrophic Year 2000-related computer system problems at those locations, the goal for the implementation of payroll processing for all duty stations in 1999, development of a data distribution capability to transfer data from duty stations and New York in a timely manner and to facilitate data exchanges between duty stations, the provision of a capability to provide remote access to IMIS by field personnel in Peace-keeping and other UN operational theatres, continued refinement of the system in the iterative processes of user involvement and user-stimulated changes and improvements in administrative work flow and processing procedures, and the progressive expansion of the implementation of IMIS throughout the UN family according to each organization's specific administrative and substantive operational needs.

14. There are also a number of organizational goals to be attained for the sustainable operation and maintenance if IMIS. These include putting in place a mechanism to assure an adequately staffed and skilled computer systems maintenance organization for the continued development and operation of IMIS in response to user needs and priorities, and, to provide suitable mechanisms for cost-sharing among IMIS user organizations and to promote and facilitate the leverage of the UN investment in IMIS to contain future expenditures for related systems amongst UN family members or other qualifying institutions.

1.2 IM/IT Management at the United Nations

1.2.1 A Decentralized Approach

15. End-user offices and units are responsible for the systems development and maintenance of their own specific and substantive applications. IMIS is the only centralised systems development initiative.

16. The technical infrastructure is maintained and operated by Information Technology Services Division (ITSD), in the Office of Central Support Services which provides and manages network services and, in general, houses the LAN network servers for user offices and units.

17. Unlike the contemporary best practices found world-wide throughout the government and private sectors the UN does not have a comprehensive corporate strategy for the management of its IM/IT resources, assets and investments. **There is no corporate and comprehensive information management plan for the UN. Leadership in IM/IT management is diffused throughout the organization with no focal point.**

18. At the UN information is not viewed as a corporate resource which needs to be managed, funded and controlled in its own right, along-side with financial, physical and human resources assets. Except, we observe one of the spin-off effects of the IMIS project is a growing awareness that IMIS is not just a computer system but that it is more importantly the sets of corporate mission critical data (which is also intellectual property) to support administrative and financial operations and to provide much information required for program planning, evaluation,

monitoring and decision making. We note that the progressive roll-out of IMIS forces management to think of who owns processes and data.

19. The forgoing results in a situation whereby budgetary control over IM/IT spending is not focussed. The management of IM/IT at the UN is spread throughout the various departments and funded by them accordingly out of operational budgets. There is no capability to state how much is expended on IM/IT over the course of a biennium or in the various departments.

20. The UN has not embraced and exploited the notion of a Chief Information Officer (CIO) responsible for the development of IM/IT policy and the planning and management of IM/IT investments. The CIO is an organizational approach to management of IM/IT which is widely advocated, embraced and followed in the government and the private sectors. The World Bank and UNICEF are two organizations which have established CIO positions.

21. Over the past decade of downsizing and diminishing budgets in governments, and also parallelled in the private sector, strategic investment in information technology and information management has been universally applied as an enabler for the reengineering of business processes in leaner and smaller organizations. We find the situation at the UN surprising for an organization with extensive global operations which has been and continues to be subject to sustained and severe financial pressures. With an absence of baseline measures of and controls over IM/IT expenditures it is impossible to ascertain the amounts of funds which are unnecessarily expended through duplication of effort and inefficient IM/IT management and practices manifested across the organization. It is our conjecture that millions of dollars may be needlessly expended world-wide annually by the UN on IM/IT by virtue of the absence of centralized IM/IT planning and coordination. Our premise is that getting control over IM/IT expenditures could yield a high payoff and lead to the avoidance of wasteful expenditures which could otherwise be used for furthering the UN's collective objectives.

22. A more serious outcome of the lack of focus on centralized IM/IT management at the UN is the current level, consistent throughout the organization, of unpreparedness for the Year 2000 threat. A centralized management approach for IM/IT planning and coordination would most likely have surfaced these threats and brought the issues to the management table several years ago.

1.2.2 Roles of ITSD

23. ITSD, the successor organization to the prior Electronic Services Division (ESD), provides, with the exception of the IMIS Project, the only centralized corporate services related to IM/IT.

24. ITSD has an establishment of approximately 110 staff and 40 contractors. Services are provided covering the technical infrastructure installation and maintenance (local area networks, workstations, peripherals and other hardware etc.), network software maintenance, telecommunications, mainframe support, and help desk services. The division does not operate a

mainframe computer. Since 1996 all mainframe processing has been performed in Geneva at the International Computer Centre (ICC), a UN common service. Limited systems development activities are undertaken by ITSD; this function is devolved to the end-using departments and offices of the UN.

25. ITSD has upgraded over 4,000 workstations to Pentium processors in the past year. It provides and manages the standard software configuration for all workstations. Most, but not all, of the local area network servers in UNHQ are securely housed in and maintained by ITSD. **All IMIS production servers in New York, for UN, UNDP and UNICEF, are collocated in ITSD with the network servers.** A help desk call centre for LAN users, contracted to a private company and operating remotely in Pennsylvania, is provided by ITSD.

1.2.3 IMIS Project

26. IMIS has been developed as a separate and distinct information management and information technology initiative at the UN. The earlier central computing organization, ESD, was not geared toward fostering systems development, and, had few available resources to assign to a major development effort. A major focus of ESD at the time of the IMIS project initiation was to cope with the introduction of personal computers and local area networks in New York.

27. A deliberate decision was made by the Administration in 1988 to develop IMIS as a separate project away from ESD. Consultants would be used to advise in the selection of appropriate leading-edge technologies and for the systems development activities such as requirements specification, design, construction and testing.

28. IMIS operates under the general direction of the IMIS Project Steering Committee. The project reports currently to the Assistant Secretary-General, Office of Central Support Services, Department of Management.

1.2.4 IT Expertise Resident with IMIS End Users

29. In the Office of Human Resources Management (OHRM) the major expertise in information systems development and maintenance resides primarily with the Human Resources Management Information Systems (HRMIS) unit. The unit is located in the Operational Services Division. This unit is responsible for maintenance of the Integrated Personnel Services System (IPSS), an application system operating on the ICC mainframe computer in Geneva. The application contains personnel data on all staff in New York and in the OAHs. IPSS was the main information repository for the automated loading of HR data into IMIS. The application, written in the Mark IV programming language and not Year 2000 compliant, is several decades old and has been maintained pending implementation of IMIS Release 1 at all duty stations. It will be terminated when the IMIS data distribution functionality (Release 5) is implemented to provide IMIS electronic connectivity between New York and duty stations. Also in OHRM, some information

technology expertise is to be found elsewhere in the Operations Services Division and in the Special Services Division.

30. In the Office of Programme Planning, Budget and Accounts (OPPBA) there are a number of substantive applications maintained, including the Budget Information System, Payroll, and the various accounting systems; a majority of these applications will be terminated when IMIS is fully implemented at New York and OAHs. These applications are processed on the UN International Computer Centre (ICC) computer in Geneva. The systems development and maintenance expertise is provided by the Systems Support Section and Data Analysis and Systems Control Unit. The Payroll System processes pay in New York for the UN, UNDP and for UNICEF. The application is written in COBOL and is not presently Year 2000 compliant. As a contingency measure against the risk of IMIS (Release 4), slippage funds have been invested and computer programming is underway to make the system Year 2000 compliant.

31. Outside of ITSD and the IMIS project, pockets of information systems development and maintenance expertise exist for specific applications in the Office of Central Support Services. The Procurement Division has experts who manage the maintenance of the Reality procurement application which is integrated with IMIS. Facilities Management Division has a single staff member who is responsible for the assured operations of more than 20 different application systems. Travel and Transportation Division maintains its own applications; although the major travel application has been subsumed by IMIS. The Commercial Activities Service Division has its own distinct technical group.

32. The Department of Peace-keeping has its own extensive systems development and information technologies expertise.

33. Treasury has no in-house systems development expertise, although it is heavily involved in the use of information technologies to perform its role.

34. Both the UNDP and UNICEF have their own extensive institutional IM/IT capabilities. In UNICEF IM/IT is centralized in the Information Technology Division which has 50 posts in New York and 100 posts around the World, in addition to 100 contractors working on projects in New York. The Director of the Information Technology Division is also the Chief Information Officer of the organization.

35. The OAHs in Geneva, Vienna, Nairobi, Bangkok, Addis Ababa, Santiago and Beirut manage IM/IT according to their local needs and with little direction from UNHQ. All locations have systems and computer programming staff on board to manage and perform the maintenance of legacy systems which have been developed locally for their own specific needs. Contractors are used where and as required. We suspect that at some locations the overall IM/IT capability may not be sufficient.

2

2 Management of the IMIS Project

2.1 IMIS Governance

36. The IMIS project reports administratively to the Assistant Secretary-General for Central Support Services, Department of Management. Overall direction of the project including strategic directions, overall funding and expenditure approvals, and approvals of releases to end-users is provided by the IMIS Steering Committee. Recently, two senior officials from UNDP have been co-opted to the IMIS Steering Committee. UNDP has committed to use all functionalities of IMIS.

37. The present constituency of the IMIS Steering Committee is:

Under-Secretary-General for Management - Chair

Controller/Assistant Secretary-General for Programme, Planning, Budget and Accounts

Assistant Secretary-General for Human Resources Management

Assistant Secretary-General for Central Support Services

Assistant Secretary-General for Planning and Support, Department of Peace-keeping Operations

Director Information Technology Services Division

Co-opted from UNDP:

Assistant Administrator and Chief Procurement Officer, Bureau for Financial and Administrative Services

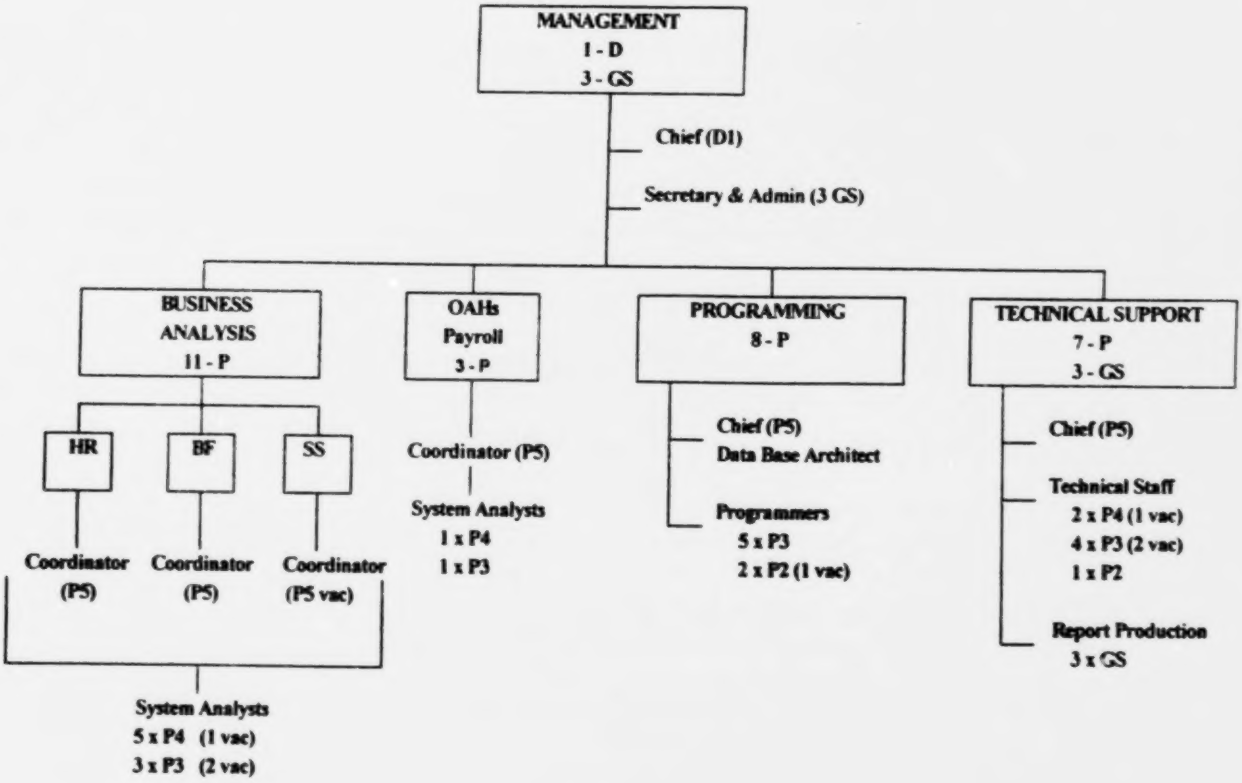
Assistant Administrator and Director, Bureau of Planning and Resources Organization

Ex-officio member: Chief IMIS Project.

2.2 IMIS Project Team

38. The organization structure and staffing level of the UN IMIS project team at the time of our study is given in the following chart.

IMIS Project Team Staffing and Organization


MANAGEMENT
1 - D
3 - GS
Chief (D1)
Secretary & Admin (3 GS)
BUSINESS ANALYSIS
11 - P
HR
BF
SS
Coordinator (P5)
Coordinator (P5)
Coordinator (P5 vac)
System Analysts
5 x P4 (1 vac)
3 x P3 (2 vac)
OAHs Payroll
3 - P
Coordinator (P5)
System Analysts
1 x P4
1 x P3
PROGRAMMING
8 - P
Chief (P5)
Data Base Architect
Programmers
5 x P3
2 x P2 (1 vac)
TECHNICAL SUPPORT
7 - P
3 - GS
Chief (P5)
Technical Staff
2 x P4 (1 vac)
4 x P3 (2 vac)
1 x P2
Report Production
3 x GS

39. The project team is presently staffed with 37 positions. There are 31 professional level positions and 6 general services positions, 3 of which are administrative support. Of the positions, 34 are part of the maintenance team, 2 are for payroll development and implementation, and 1 is for OAHs coordination.

40. The responsibilities of the Business Analysis units include: review and evaluation of requests for changes and new functionalities coming from the user areas; recommendations for modifications; writing design specifications; providing guidance to the programmers; writing and updating procedures and documentation; review and testing of programmes; support to the

information units in the offices in the Department of Management; and, liaison with UNDP, UNICEF and ILO on matters concerning design, development and implementation.

41. The Business Analysis maintenance function is divided into three substantive units: Human Resources (HR) and Support Services (SS); Finance including Payroll (BF); and, Treasury (TR) and Technical Cooperation (TC). The three units are headed by a coordinator at the P5 level. The development function Payroll coordinator is at the P4 level. The vacancy at the P5 level for the Treasury and Technical Cooperation unit is presently being staffed, as are the three vacancies for system analysts in the Business Analysis function. The coordinator of the HR/SS Unit is also coordinating payroll integration with human resources. The coordinator of the Finance Unit is also coordinating payroll integration with accounting. The implementation at OAHs is supported by a coordinator at the P5 level. The Payroll coordinator and one analyst focus on the development and testing of payroll and associated functionalities, such as leave and attendance and insurance.

42. The UN has to respond to the inevitable termination of the contract with the Prime Contractor. Over the past several years computer programmers have been recruited by the IMIS project with skills in the various softwares being used. Therefore, some sufficiency has been developed to address systems maintenance requirements which are not carried out by the Prime Contractor. There are presently eight positions in this function, including one vacancy which is being staffed. However, we note that in the Seventh Progress report of the Secretary-General on IMIS, A/C.5/50/35 a staffing level of 12 programmers was proposed based on the then identified requirements for IMIS maintenance. **This level included some support for report writing, but, as noted elsewhere, the programming support this area has tended to be grossly underestimated.**

43. The Technical Support functions include many which have so far been partially performed by the prime contractor under development and maintenance agreements, and partly by a few IMIS team members. Each member of this unit is required to perform back-up tasks for other members of the unit. The responsibilities of the unit include system administration, database administration and support, configuration management, reference table verification and coordination, commercial software integration and planning, and, technical planning, research and development.

44. The responsibilities of the IMIS team cover a broad range of technical expertise. In Annex II we list the roles and areas of responsibilities for the members of the project team, and the specialties and expertise which the members collectively bring to the team.

45. **The IMIS team is a group of highly skilled managers and staff members with an exceptional dedication to making IMIS a technical success. Special attention has been focussed on ensuring that the composition of the team covers the core competencies which have hitherto been provided by the Prime Contractor. Staff members regularly work extended working days as a matter of course. In this team, long days appears to be the norm.**

46. **Our overall key assessment is that the team, as presently comprised and including the continuing presence of the Prime Contractor for the immediate future, is barely able to cope**

with the pressures of meeting the required roll-out of finance and payroll at all duty stations by 1999 and to meet the additional demands for additional reports. Our second major assessment is that there is insufficient capacity in the team to develop in-house a field version of IMIS including the attendant remote connectivity.

2.3 IMIS Prime Contractor

47. The prime contractor for IMIS was retained through a competitive procurement process in 1991 for the detailed design and construction of IMIS. The contractor was successful from amongst nine bidders. The bid package and the scope of work and anticipated project schedule therein was based on a requirements definition stage previously undertaken by external consultants with the participation of project and substantive staff at HQ and at the OAHs.

48. Details of the contract history with the Prime Contractor are the subject of a second and parallel study requested by the General Assembly under the same resolution as the present study and will not be covered in this study report.

49. The contractor has worked on the contract in excess of six years. We are advised by the contractor that in excess of 451,000 hours of effort has been billed to date on the project. We translate that to the equivalent of more than 240 person years of effort. Presently the contractor has over 40 staff members working in New York for the UN on IMIS. In addition, the contractor has separate contacts with UNICEF and with UNDP to make, with the agreement and involvement of the UN IMIS Project, changes to enhance IMIS to meet the additional functionalities required by those two organizations.

50. The rates charged by the Prime Contractor to the UN for its services are those of the initial contract revised upward for cost of living increases over the life of the contract. The contract, which calls for the successful development of all the required software, has slipped vastly from its initial targeted completion date for reasons which have been stated to the General Assembly in the recent annual reports of the IMIS Project to the General Assembly. This slippage has left the contractor in a situation where it is providing expert resources to the project and billing them to the UN at rates which are contracted for but which are much less than the current market rates in New York and the USA in general. There is, of course, an ever-increasing upward pressure on market rates caused primarily by the panic in the World to fix the impending Year 2000 computer problems. In the present market environment it is more difficult than in the past to find design and programming staff with the technical knowledge and programming skills required for IMIS. Further, contractor staff owe no allegiance to the United Nations and many wish to further their careers and/or interests by moving onto other projects.

51. These factors make it even more difficult today for the contractor to continue to provide a high level of responsiveness to the United Nation's needs concerning IMIS. We understand, however, that the contractor has assured the IMIS Steering Committee that the company will continue to support the United Nations to the fullest extent possible until the development of the IMIS Payroll

and Data Distribution releases is complete, the latter presently scheduled for May 1999.

2.4 *IMIS Costs*

2.4.1 *Direct Project Costs*

52. The proposed and planned financial expenditures on IMIS were presented in the ninth progress report of the Secretary-General in December 1997 in the programme budget for the Biennium 1996-97 (A/52/711).

53. In those revised estimates an increase of $10,362,100 was requested for expenditures for development and implementation of IMIS. Of this requested amount, $5,500,000 was approved. The revised project budget is shown in the following table. These expenditures are for development and world-wide implementation activities.

Project Development and Implementation budget
projections and approved spending level
(Thousands of United States dollars)

	Estimated expenditure as of December 31, 1997	Estimated expenditure 1998 to project end	Revised total
GTA/Overtime	12,847.3	6,650.5	19,497.8
Travel	707.0	471.0	1,178.0
Training	2,910.0	1,960.0	4,870.0
Contractual services	36,871.7	5,378.0	42,249.7
Communications	290.0		290.0
Supplies/misc.	165.0	48.0	213.0
Hardware	2,825.0	95.0	2,920.0
Software	1,630.0	100.0	1,730.0
Total	58,246.0	14,702.5	72,948.5
		1998-1999 Approved Budget	**68,086.4**

54. Expenditures for IMIS system maintenance and operations was sought and approved at a level of $9,825,000 for 1998-1999. These costs are for the on-going operation and long-term maintenance of the software and of the hardware in New York and at all duty stations.

55. IMIS incurred project costs go far beyond the costs normally associated with systems development. They include an inordinate amount of costs associated with data conversion and implementation, many of which were for functions which should have been performed in the user areas. The IMIS project costs include three different types of expenditure, system development (or otherwise referred to as construction), implementation and maintenance. An understanding of the extensive scope covering HQ IMIS and substantive users and the OAHs for these three specific cost categories is documented in Annex II of the programme budget for the Biennium 1996-97 (A/52/711).

2.4.2 Indirect Costs

56. Costs borne by other organizational units to effect the implementation of IMIS include:

(a) the costs of the posts redeployed to IMIS for the 1996/97 biennium;

(b) some staff costs for Implementation in Geneva;

(c) ITSD staff costs to support Sybase/UNIX operations. Similar costs are being incurred at OAHs;

(d) data collection and cleansing in various offices;

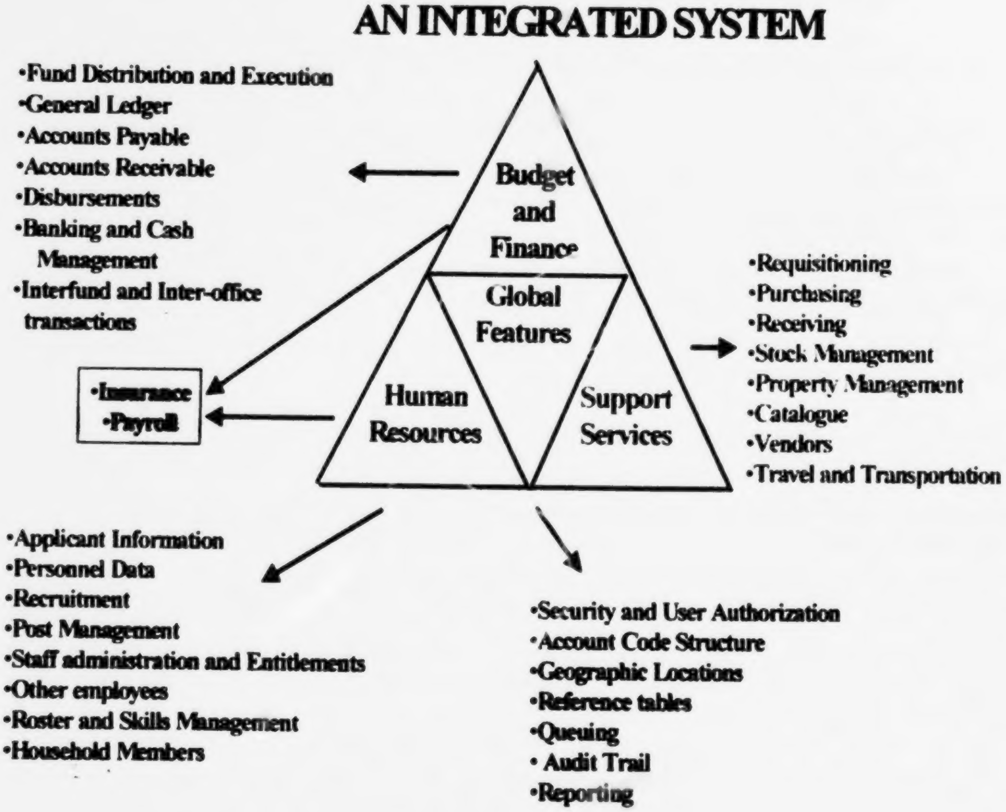
(e) help desk activities and ongoing training performed by OHRM and Personnel sections at OAHS; and

(f) costs which have been financed directly by ILO for generalization of the HR release, and UNDP and UNICEF to meet their specific IMIS functional requirements.

The levels of expenditures incurred in these activities is unknown.

3

3 IMIS Development and Implementation


AN INTEGRATED SYSTEM
•Fund Distribution and Execution
•General Ledger
•Accounts Payable
•Accounts Receivable
•Disbursements
•Banking and Cash Management
•Interfund and Inter-office transactions
Budget and Finance
Global Features
Human Resources
Support Services
•Insurance
•Payroll
•Requisitioning
•Purchasing
•Receiving
•Stock Management
•Property Management
•Catalogue
•Vendors
•Travel and Transportation
•Applicant Information
•Personnel Data
•Recruitment
•Post Management
•Staff administration and Entitlements
•Other employees
•Roster and Skills Management
•Household Members
•Security and User Authorization
•Account Code Structure
•Geographic Locations
•Reference tables
•Queuing
• Audit Trail
•Reporting

3.1 Truly Integrated Functional Design

57. The tenet of the IMIS functional design is that there will be one overall computer program to process all the required business functions in an integrated manner. This is different from the

traditional and conventional 'stove pipe' approach toward computer systems design in which there were separate computer programs for each business function and in which the sharing of data was accomplished by passing data from one application to another. Even the on-line computer applications of the 1970's and 1980's were generally designed for specific non-integrated business functions.

58. In the IMIS integrated design all data is stored in one database and is available for all functional programs to use. **Validation of the integrated design approach embarked upon by the UN in 1992 is borne out by the current global trends in information systems strategic sourcing.**

59. During the past decade a strong capability in packaged systems has emerged in the marketplace. Many governments and the global private sector have turned to these technologies as solutions to replacing aging legacy computer systems and to leverage and implement business re-engineering initiatives. The use of these packages is based on initial or preliminary expectations of reduced systems development costs as the base functionality purchased is already provided with the package, and, all that is required is to fit the package into the user organization, a process which is less costly than developing from scratch. Another strategic reason for the market growth of these packaged solutions is the Year 2000 problem. Users have bought and installed these solutions to replace their own computer systems which will fail to operate correctly in the year 2000. Well known international companies now provide packaged business solutions. Some vendors focus only on one market segment, such as human resources, payroll, or financials; whereas others have some capabilities for linking several application segments together, to various degrees of sophistication.

60. The usual approach taken by users is to buy the 'best of breed' solution for the business area under consideration. For example, many organizations have bought a specific vendor's package as a solution for their human resources processing needs. Others may have acquired a package from a different vendor for their financial needs. And others may have chosen another supplier of expertise for their payroll needs. In fact, many organizations have installed solutions from different suppliers for differing business needs, choosing their own specific choice of 'best of breed' solution for each business area. This has promoted integration difficulties as the packages from different vendors do not always fit together easily, and thus has led to additional costs in organizations which need a more integrated approach.

61. A number of the major players do in fact provide solutions which integrate a number of business areas. Recent research by a respected research organization in the areas of information management and information technologies, suggests that by the year 2002 the proportion of enterprises using the same provider for human resources and financials will rise from 20 percent to more than 40 percent. There is a marked directional shift from 'best of breed' selection toward more integrated solutions as attention turns to resource optimization. Definitional differences between the creators of information in an organization and the myriad of users of that same information across the organization make interface definition between 'best of breed' solutions difficult. Integrated solutions have the best chance to close this gap as they can 'own' both sides of the equation.

62. In the Government of Canada IM/IT cost reductions have been attained through a combination of a shared systems approach and the use of 'best of breed' technologies. More than 20 different departments and agencies, but not all government departments, use the human resources packaged software from one specific supplier. These departments pay for their own user licences, at rates negotiated centrally in a government-wide contract, and all contribute to the funding of maintenance and enhancements which are necessary for the operation of the package in the federal government environment (for example, an interface to the Salary Management System, another widely used application which was developed originally by one department and then which became another shared system). A department which requires modifications or enhancements which are specifically related to its own operational needs will fund such modifications directly.

63. Likewise, 15 Canadian government departments use a different supplier's financial and asset management packaged software under a similar shared systems management regime. This software was centrally selected by a competitive and rigorous procurement process in order to address the Year 2000 consequences of the aging legacy systems in departments. This software went live in 11 of these departments in April 1998, including universal installation in over 100 missions around the World.

64. However, departments are not mandated to use any particular solution. They use whatever makes sense to them based on a technical and substantive business case analysis. The aforementioned supplier's application is not the only financial system in use. Several departments use a different supplier's financial application which is also integrated with Materiel Management functionality, again under a shared systems umbrella arrangement.

65. Experiences in the government and private sectors show conclusively that the entry costs to fit and use some "off the shelf" packages are much higher than expected, even under a shared systems regime. **The costs of implementing packaged financial solutions is consistently over budget in organizations which are installing these packages. In addition, many such organizations initially implement only the essential "must have" basic functionalities. In subsequent phases further expenditures are required to implement some of the extended functionalities which have not initially been implemented.** The highest cost component is the fees for consultants. Like their counterparts working on the Year 2000 solutions, these analysts and programmers with skills in these packages are limited in numbers and can command higher daily consulting fees. **Some Member States will no doubt find similar experiences in their own government jurisdictions at the national, state, regional, municipal and local levels.**

66. In the Government of Canada and elsewhere some user organizations are using 'best of breed' solutions from different suppliers for their discrete human resources and financial systems solutions. Additional costs were incurred in developing the interfaces between these two specific applications. It is not an ideal solution as there is not always a good fit between the packages. More and more it is being realized that there are measurable benefits, in net systems cost

reductions and in having complete and timely information for decision making, in having an integrated solution. In fact, some organizations in hind-sight, in their strategic planning, lean decidedly toward dropping one of the packages in favour of using a more integrated package from a single supplier. This is consistent with the trends cited by a leading industry research group.

67. Member States will most likely find similar experiences in their own government sector and private sector where application software packages have been used. The entry cost is generally much higher than expected, maintenance costs are usually much higher than the estimates given prior to embarking on this type of solution, and, interfacing packages from different suppliers is not as easy as the package vendors make out.

68. IMIS is designed to provide truly integrated functionality. **The empirical evidence of emerging trends in systems acquisition confirms that, according to today's benchmarks, the original vision and design goals for IMIS was ahead of its time. In our view, there is no presently available commercial software which offers the full extent of integration of UN administrative and business data as that provided by IMIS.** It is also our view that some years will elapse before a similar capability which could reasonably meet the UN's administrative and business requirements will be commercially available.

69. In developing IMIS a deliberate strategy was used to encourage the use of and to interface with commercially-available third party vendor applications where these were appropriate to the business function. This was done initially in the area of procurement and fixed assets management where a commercial software package was in use. IMIS exchanges data to and from this system. The IMIS project has funded the purchase of the same software licences for use at the OAHs.

70. Other commercial software which have been acquired for treasury functions and which are being interfaced to IMIS are software for printing cheques as output from the accounts payable function, software for investment management processing, and software for the electronic commerce and direct funds transfer agent to make payments directly into bank accounts.

3.2 Phased Release Plan

71. The IMIS application is being implemented in five major stages, or releases as they are known. Following the phased release strategy the functionalities of IMIS have been progressively installed, not without extreme difficulties and with severe slippage from earlier expectations, since 1993. The first release, Human Resources Management, has also been installed at the seven OAHs; these installations were made over the period 1996 through 1998. Installation in Beirut was deferred pending completion of the move of ESCWA to Beirut.

72. Installation at some of the overseas duty stations was complicated by the logistics of getting the computer equipment to the duty stations and getting it installed by the regional representatives of the equipment vendor. Delays were experienced but the installations were eventually

completed successfully. The situation will not arise for future releases of IMIS as the hardware is already in place and operating.

73. **It is critical to ESCWA that IMIS Finance and Payroll releases be working in 1999. This is because of the Year 2000 problem and the situation at ESCWA that the existing financial and payroll computer systems at that OAH are not programmed to work properly in the year 2000 and cannot be fixed in time. The expectation has always been that IMIS software, which is Year 2000 compliant, will have been installed and will have replaced the existing legacy systems at all OAHs prior to the year 2000 arrival. Other OAHs are in the process of making their existing financial and payroll computer systems Year 2000 compliant. At these locations there is therefore a tolerance for slippage of roll-out beyond the Year 2000 opportunity window.**

74. The chart on the following page shows the schedule of releases and the planned schedule for roll-out completion.

3.3 Human Resources Management at Headquarters

75. Release 1, Human Resources Management, is currently operational at Headquarters and overseas duty stations. By this statement we mean that the IMIS computer programs are installed and operating to current specification. On the other hand it does not mean that the application is being used to the maximum benefit of the organization.

76. Particularly at Headquarters the implementation of the HR release has been painful and there is a still high level of discord amongst users on the adequacy of the computer system functionality. **Stemming back to the assumptions of the original planners of IMIS in 1988 there were a number of major flaws in planning for IMIS. First, there was an assumption that the historic data and the administrative records to be loaded into IMIS were complete and accurate. This was not in fact the case and much effort was spent in 1993 and subsequently in data cleansing in order to populate the IMIS database with reliable and complete HR data.**

77. **Circumstantially OHRM had few resources to participate in the user testing and subsequently the loading of the data. This was due to the increased demands on the Administration to provide support to missions away from headquarters and the series of staff reductions which the organization went through. The situation was that the computer system was ready to be used but the primary user organization, OHRM, had few resources to adequately test the system and to load the data. Consequently the IMIS project used the Prime Contractor to provide assistance in data cleansing; this type of expenditure was never envisioned in the original project budget submission.**

IMIS Implementation Status and Intentions

plus other organizational directions for solutions

		Release 1		*Release 2*		*Release 3*			*Release 4*				*Release 5*
		Human Resources	**no. of active staff records**	**Entitlements (reengineered) *****	**Education Grant**	**Finance & Support Services**	**Travel**	**Technical Cooperation**	**Insurance**	**Time & Attendance**	**Rental**	**Payroll**	**Data Distribution**
New York *	UNHQ	1993	7,500	Apr 98	1997	1996	1997	1998	*1999*	*Apr 99*	*Aug 99*	*Aug 99*	*Jun 99*
	UNDP	1996	2,700	Jul 98	*1999*	*1999*	*1999*		*1999*		*1999*		*Jun 99*
	(UNFPA)												
	(UNOPS)												
**	UNICEF	1998	7,000	*1998*	*1999*	----							*Jun 99*
Geneva	UNOG	1997	3,420	*Aug 98*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
	(ITC)												
	ILO	1995	2,650	*1999*	*1999*				*1999*	*1999*	*1999*	*2000*	*Jun 99*
Vienna	UNOV	1996	832	*Aug 98*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
Nairobi	UNON	1997	1,131	*Nov 98*	*2000*	*2000*	*2000*	*2000*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
Bangkok	ESCAP	1996	630	*Aug 98*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
Addis Ababa	ECA	1997	762	*Aug 98*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
Santiago	ECLAC	1997	967	*Sep 98*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*2000*	*Jun 99*
Beirut	ESCWA	1998	245	Jul 98	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*1999*	*Jun 99*
			27,837										

* Including approximately 2,500 administered by FALD for Peacekeeping

* Less than 20% of IMIS HR transactions administered by OHRM

* UNHQ has a further 53,000 inactive members in the database and there are 15,000 household members

** UNICEF also has a further 7.000 retirees in their IMIS database

*** Entitlements were initially installed in UN Headquarters in 1995

78. **The lack of directed resources within OHRM contributed to the extended and unanticipated implementation delays of Release 1 at Headquarters. The office has assigned an insufficient number of staff to the implementation of IMIS.**

79. The root cause of this problem is one which is common in the information processing industry. **Successful systems development entails a high degree of user involvement and dedicated participation in confirming specifications, user system testing and in loading data into the new system.** However many organizations are unaware of this cost component of developing a new system, the need to plan for additional resources in the development and transition period, and, are consequently unprepared to assume these responsibilities when called upon. The priorities of maintaining day to day operations override those of developing new systems. In the case of IMIS the original project planners failed to communicate this need in seeking project approval and in setting up the project. **This resulted in these additional resources and costs not being budgeted for. Plus, the need for these types of resources were not taken into account when staff reductions took place in OHRM.**

80. Today there still exists gaps in realizing the full potential of the HR component. The computer database is designed to store recruitment and skills data. However the data on skills of staff members and applicants and consultants and recruitment data have not yet been put into the system at Headquarters. For whatever reason, the Office of Human Resources Management has not taken action to use this management tool which is made available by IMIS. It is not the responsibility of the IMIS project to load the data using limited and precious project funds. Ownership of this set of data undoubtedly lies with OHRM and, notwithstanding that flaws in the original project budgeting omitted to point out that funds and resources might be required for entering the administrative records into the IMIS database, that office, as the substantive user and beneficiary of this systems capability, should fund and perform the database population and operation. It is of note that UNICEF has loaded this type of data into its production version of IMIS and is using this functionality; we also understand that some of the OAHs are also using the same recruitment and skills modules of IMIS. It is our further understanding that at the time of our study plans were being made in OHRM to load this type of data into IMIS.

81. The Compensation and Classification Unit of OHRM is responsible for receiving the salary tables from the International Civil Service Commission (ICSC), ensuring that the New York payroll system is updated with current data, and communicating the latest salary tables to OAHs. In IMIS this data is maintained in a specific reference table which must be kept current by the unit. The unit has the responsibility to keep up to date the UNDICS reference system used by all organizations in the UN System and the IMIS reference table. At present there is one GS staff member who is assigned to do this work for both systems. We are advised that the work is too much for one person. No other OHRM staff member has been trained to update the IMIS compensation-related tables at Headquarters. **This exposes the planned processing of payroll through IMIS to a very high level of risk. OHRM must ensure that additional staff members are trained to update the salary reference tables and that this knowledge be maintained adequate to meet payroll production contingencies.**

82. The Compensation and Classification Unit also receives Daily Subsistence Allowance data from ICSC for input to IMIS for the travel and relocation functionalities. The IMIS project developed a capability for an automated interface from ICSC to IMIS for this data. A similar capability has been developed for IMIS to automatically upload salary scales submitted in electronic form. A similar capability should be developed to upload ICSC post adjustment circulars into IMIS. This will reduce the level of effort required in the Compensation and classification Unit.

83. Following the introduction of Release 1 there has been a large number of critics who advocate that IMIS does not do what is required. The project team has responded, under the direction of the IMIS Steering Committee, in making changes to the computer system when and as precise arguments are made by the users to justify changes. **It is a fact that for all IMIS releases the original computer system specifications developed by the contractor on the basis of user specifications and approved by the then managements, particularly OHRM and OPPBA, were not complete. The lack of user involvement in the original designs was sadly lacking, resulting in the contractor delivering a computer system which in many areas was built to the wrong specification. This is not unusual in the information processing industry. The computing world is littered with similar stories of lack of user involvement leading to project woes, schedule delays, cost over-runs, project cancellations and ultimate user dissatisfaction.**

84. Criticism still exists stating that for HR the IMIS does not support the reform process, that it automated the old HR business practices. This could be true. However, it was and is not for the IMIS project to do the reform of HR business processes. Such substantive HR business re-engineering and process reform must be championed, driven and engineered by OHRM. It is something for substantive HR specialist and change management facilitators to do, with the computer systems specialists providing advice and assistance as required. The computer specialists should be involved in the reform process by advising on how technologies can be used to advantage to support advocated business processes reform options, and, to design procure or develop the required systems when funded. **What happened with IMIS is that the computer system development had to go ahead without OHRM undertaking major substantive business reforms or business process re-engineering, as in the other substantive areas.** Although, IMIS has forced many changes, for example in the area of delegation of authorities.

85. In summary, we conclude that over the years OHRM management failed to adequately manage the situation that IMIS was being developed to replace old legacy computer systems, to build a complete and accurate database of HR information and to provide automated platforms to support reforms in HR matters. **We emphasise that, in our opinion, OHRM did not provide the leadership required to ensure a timely and successful implementation of the IMIS Human Resources Management release at Headquarters. Management focus and attention on proactively dealing with the impact of IMIS on OHRM and the need to assume leadership in the management of change brought about by IMIS still appears to be insufficient.** Within the Office IMIS is widely viewed as an inconvenience rather than an opportunity. The need for providing training to or ensuring training for UN staff members in the

use and operation of IMIS and in the retrieval of data from the system has been neglected by OHRM. But, de facto, IMIS has led to the cleansing of human resources data and improved access to data in support of the OHRM operations.

3.4 Human Resources Management at OAHs

86. Following the initial version of the HR release in 1993 a significant period of time elapsed before the software was rolled-out to the OAHs. In this period the database cleansing activities were undertaken at Headquarters and changes were made to the software to address deficiencies in the original functional specifications. Release 1 is installed and operating at all OAHs. These installations took place over the period 1996 through early 1998.

87. Each OAH sends a monthly extract of the database to Headquarters (OHRM) for consolidation and reporting of HR measures on a global basis. The monthly extracts are sent by courier. There is a degree of dissatisfaction amongst planners and policy makers on this method and capability of reporting OAH data. Users of the system also state that they are hampered by not having a convenient procedure for processing staff members who are transferred from one duty station to another. These deficiencies will be rectified in Release 5, Data Distribution, which is targeted for delivery in May 1999.

3.5 Human Resources Management at UNDP, UNICEF and ILO

88. In 1996 Release 1 of IMIS was installed at the UNDP in New York. There are approximately 2,700 staff members in the UNDP IMIS database. UNDP payroll is presently processed by the UN Secretariat, specifically the Accounts Division of OPPBA. In future the payroll for UNDP will be processed by OPPBA using the UNDP IMIS database. The IMIS computer hardware for UNDP is located with and operated by ITSD.

89. UNICEF payroll is also processed by OPPBA. Release 1 of IMIS was installed in UNICEF in 1998 in readiness for the new payroll system. There are approximately 7,000 active staff members in the UNICEF Release 1 database plus a further 7,000 retirees. Similar to the UN Secretariat the organization encountered delays of more than six months in loading 5 years of historic data. Like the UN, the data in the legacy systems was incomplete and often incorrect. UNICEF has specific HR requirements which were not completely included in the IMIS functionality. The organization has invested funds to make modifications to IMIS to provide the required functionalities, particularly for enhancements in the recruitment component. The UNICEF IMIS computer servers are located with and operated by ITSD.

90. UNICEF plans to use a commercial software package for its finance and accounting requirements. To do this UNICEF is developing unique interfaces between IMIS and the commercial package software in order to capture financial data related to payroll. This

development activity is also being funded by UNICEF.

91. UNICEF is in the process of fielding its Project Manager System (PROMS) which is scheduled to be installed at 150 locations around the World. This in-house developed application is scaled to run on lap-tops for small units to servers in offices of 400 staff. UNICEF had the advantage of the IMIS specification in developing the HR functional specifications for PROMS. Installation at all locations will be completed by December 1998. PROMS will interface with both IMIS and the commercial software package.

92. UNICEF, UNDP and UNFPA last year negotiated a contract for the provision of global communications services with SITA, the telecommunications common service provider established by and used by the airline industry. UNICEF will use SITA to connect remote PROMS locations to the New York PROMS hub several times a day. In this way the central hub will be current as it replicates the global position and will also serve as the backup repository for PROMS data.

93. The UN Secretariat was invited to participate in the SITA contracting process in conjunction with UNICEF and UNDP. The UN does not have a contract in place with SITA.

94. ILO, based in Geneva, has been processing IMIS Human Resources since 1995. There are 2,650 staff members recorded in the ILO IMIS database.

3.6 Staff Entitlements

95. Staff entitlements is a complex subject area at the United Nations. Such complexities pose administrative difficulties in consistently and accurately applying the entitlement rules at all OAHs and for every staff member. Under IMIS this situation will improve. The same entitlement rules will be applied consistently at all duty stations as the same entitlement computer programs and reference tables will be used at these locations. Changes in entitlement rules will be distributed to every duty station as they come into effect. The approved rules will be applied equally and fairly to all.

96. Entitlements are calculated using the staff member's HR records which are in the IMIS database. It is imperative, to assure integrity of entitlement calculation and the subsequent payroll processing, that all required personal data for the staff member be entered accurately, completely and in a timely manner. The responsibility for this type of input will no longer be primarily the responsibility of the Payroll Section. Most of this required data will be entered by the executive and administrative offices in the form of personnel actions. At Headquarters OHRM and OPPBA are in the process of ensuring that the necessary data elements are in the database, in preparation of the conversion to the new IMIS payroll system in early 1999.

97. IMIS uses computer software known as an expert system to calculate entitlements. This approach is now gaining momentum amongst suppliers of integrated commercial human resources, payroll and accounting software packages.

98. Entitlements which are to be calculated by the expert system are:

Dependency Allowance
Death Benefit
Adjusted Dependency Allowance
Gross Salary
Hardship Element of the Mobility and Hardship Allowance
Mobility Element of the Mobility and Hardship Allowance
Non-Removal Element of the Mobility and Hardship Allowance
Language Allowance
Non-Resident Allowance
Pensionable Remuneration
Post Adjustment
Salary Differential
Service (Recruitment) Allowance
Staff Assessment
Termination Indemnity
Education Grant
Rental Subsidy
Insurance.

99. Release 2, Entitlements was initially installed at Headquarters in 1995 with limited success. The personnel elements in the database were not complete and accurate and some errors had been made in the program specifications. In 1996 the release was switched off due to performance problems with Release 3, Finance and Support Services.

100. The initial (advances) part of the Education Grant was installed in July 1997, ahead of the re-engineered Release 2. This enabled this specific functionality to be introduced to the user community without the complexity of the introduction of other new functions. This was in line with a strategy to introduce changes in small amounts wherever this was possible and practical. In this way users can focus on learning the new features in a gradual and continuous manner. The second part (settlement of claims) was installed in April 1998.

101. The major release of entitlements took place at Headquarters in 1998. It is presently planned that the release will be installed at OAHs by September 1998. This will be followed at UNICEF later in 1998 and UNDP and ILO in early 1999. The Education Grant will be installed with Release 3.

102. Testing of the Rental Subsidy entitlement is currently being performed.

3.7 Finance and Support Services

103. The Finance and Support Services function has been implemented so far only at Headquarters. The implementation took place in April 1996. New business functionality is included for the accounting component, such as a major structural change in the process of accounting with the introduction of an improved Budget Accounting Classification (BAC) coding block and an automated funds sufficiency control.

104. As has been noted in the several reports of the Board of Auditors concerning IMIS the implementation in 1996 was fraught with difficulties. In our view these problems can be attributed to a range of factors which could possibly have been more adequately controlled by the United Nations. **However, it is also a fact that the organization has never before undertaken a change of such magnitude in its computer processing systems and did not anticipate the amount of effort required on the part of the user community to implement these changes. This is not unique to the UN; it happens globally.**

105. In this respect the symptoms are the same as those for the prior and also difficult implementation of the Human Resources Management release. Data was not prepared sufficiently in advance of the database loading, legacy files were not converted correctly to the IMIS database format and some required data was incomplete. The computer systems specifications for the programs which were delivered were in many instances incorrect, even though the IMIS project developers has spent a large amount of time with the budget and accounting users in order to confirm specifications and clarify the complexities of the processing rules for accounting. IMIS had to automate in excess of 6000 accounts posting rules. This figure illustrates the complexity of the UN accounting system which had to be dealt with. **It is doubtful that the original IMIS planners conceived or even understood the magnitude of the task to be undertaken and this is another reason why the original project estimates for cost and schedule were significantly understated.**

106. The implementation of Release 3 was also fraught with a lack of diagnostic tool to assist the users in the implementation and conversion. **It must be remembered that the conversion was undertaken in April 1996, three months into the biennium. In the ideal sense this is not the best and the easiest time to implement an accounting system. This is most conveniently done with the least amount of pain at the beginning of an accounting period when there is no actuals data for the accounting period to be converted. We understand that due to a combination of the sequencing of the completion of the computer programming and the testing by the users, and, the lack of availability of OPPBA staff members who were required to close the books for the just completed biennium, the Administration had no alternative other than to commence Release 3 part way through a biennium.**

107. Implementation was hindered further by inadequate accounting reports and a lack of comprehensive diagnostic tools coupled with inadequate processes to reconcile conversion. These

essential items were not delivered by the project to the users. In fact the need for these tools was only clearly identified by both users and the project team following the start of implementation and as reconciliation with the legacy system data was attempted. The Board of Auditors has commented on this area. The Project team incurred unanticipated costs in developing additional accounting and diagnostic reports.

108. Deficiencies in the original delivered computer system have been and continue to be addressed. Critical errors have been corrected and a major release of enhancements and corrections will be made in January 1999. **The initial and serious difficulties experienced in 1996 have been overcome and progressively corrected through two years of production use and continuous problem resolution and prioritized enhancement. Users of the application in OPPBA are now competently using the new system and the period-end financial accounts of the organization are being closed in a timely manner.**

109. In the area of Support Services the functionality is well accepted by the users. The interface between IMIS and the commercial system operated by the Procurement Division of OCSS provides a confirmation of the value to the organization of a tightly integrated management information system. The Travel application has been applauded by the user community.

110. Release 3 has not been implemented yet at OAHs. The decision of the Project Steering Committee on the counsel of the Accounts Division is that installations at OAHs will not be made until the enhanced financial release is fully proven following installation at Headquarters. Thus the planned schedule is for all OAHs to be on-line by February 2000 (ESCWA being the final installation). As noted previously, this is a business imperative to avoid the Year 2000 problems at OAHs.

111. UNDP plans to implement Release 3 of IMIS. This will be done in 1999. UNDP has retained the services of the UN systems development prime contractor, under a separate contract to make the modifications necessary for the UNDP implementation. A separate team of Prime Contractor staff is physically located with UNDP to service this client. This team works jointly with the IMIS project in developing a unified set of programming code which will be integrated into IMIS.

112. With the involvement of UNDP, IMIS provides the capability to process accounts on two different bases of accounting. UN records and processes accounts on a full accrual accounting basis. UNDP records and processes accounts on a modified cash basis; a cash accounting basis is generally used, but interest is reported using the accrual basis. These two different accounting principles are programmed into IMIS accounting logic. This affords the opportunity for any member organization of the UN system to adopt the IMIS accounting application according to its accounting principles with little modification required to the existing computer programs.

3.8 Technical Cooperation

113. Technical Cooperation is part of the Finance release. It provides a capability to account for technical cooperation expenditures which have a different accounting treatment from the regular UN budget. In January 1999 detailed budget execution, expenditures recording and project reporting will be introduced.

3.9 Payroll

114. The Payroll release is in the final stages of programming and the user testing at Headquarters will commence in September. The testing approach calls for at least six pay cycles to be processed over a period of several months. The IMIS design approach is that payroll will be calculated directly from staff members' HR records by first calculating the entitlements due the staff member, processing leave and attendance data for some categories of staff, and then calculating the gross and net pay. The application is designed to process at all duty stations. This will assure uniformity of the application of pay and benefits rules throughout the organization. Extensive consultation with all OAHs has been used to develop the comprehensive specifications.

115. **At Headquarters the Payroll Unit of Accounts Division, OPPBA has taken a pro-active position and is engaged in ensuring that the IMIS database of staff member data is complete and accurate. This is being done in preparation for the payroll application to go live.**

116. In New York the UN processes the payroll for UNDP and UNICEF. These two organizations have already implemented IMIS Release 1 in readiness for the payroll calculation. It is planned that payroll will be implemented for these two organizations in 1999. UNICEF will have to build interfaces between IMIS and the commercial finance package in order to process the accounts resulting from the IMIS generated payroll. This is an issue which UNICEF must address. It is outside the purview of responsibilities of the IMIS project team.

117. OAHs will have payroll implemented subsequent to the confirmation of the application performance at Headquarters and the successful implementation of Release 3, Finance and Support Services at the specific duty station. The payroll application is designed to permit payroll units to schedule pay with differing pay frequencies for different groups. This provides the flexibility which is needed in the globally operating organization. The integration of payroll with disbursements also provides for the complete methods of pay, being direct bank deposit, cheque and cash.

118. **Given the past IMIS implementation experiences at Headquarters we assess that the implementation of finance and payroll at OAHs will be a difficult task. IMIS will be equally as significant a change at those locations as it was in New York.** We wonder about the readiness of the staff at duty stations to take on the systems conversion load in addition to their

normal operations duties, and whether there are the necessary skills amongst the staff to operate and maintain IMIS. We recognize that the finance software will be more stable and that the diagnostic tools and reporting capability will be superior to those initially available at Headquarters, but we do not believe that the system will be implemented without data completeness and validity problems similar to those which were experienced at Headquarters. **The Administration must take contingency measures to mitigate these risks. This can be done by planning now to make sure that adequate numbers of properly trained resources are in place when required, and that the data conversion programs for each duty station are developed and adequately tested well ahead of the implementation time.**

3.10 Leave and Attendance

119. Leave and Attendance is likely to be implemented ahead of the Payroll release at both Headquarters and at the OAHs. The computer programs are now ready for testing and a multi-disciplinary testing team is being set up under the leadership of OHRM. When the testing is completed to the satisfaction of all involved stakeholders the module will be implemented at headquarters ahead of the general payroll release. This follows the Steering Committee approach of introducing and managing change in a gradual continuum to the extent that this is possible. This module can also be rolled-out to OAHs ahead of the finance release.

3.11 Insurance

120. Insurance is another function which likely to be implemented ahead of the Payroll release. This functionality is also ready for testing and can be released ahead of the general payroll release. This module can also be rolled-out to OAHs ahead of the finance release.

3.11 Treasury

121. The Treasury reports directly to the Under-Secretary-General, Department of Management. The operations of the Treasury have been improved by the implementation of IMIS. In the area of cash management-the Treasury is responsible for making all payments on behalf of the United Nations Secretariat, and, UNDP and UNICEF for Payroll. The detailed information provided by IMIS, not previously available from the existing legacy systems, provides the Treasurer the possibility to schedule payments in a more effective manner in light of the particular cash position at the time.

122. IMIS has been interfaced with commercial software for production of payments by cheque. The IMIS project team is working with Treasury to implement another commercial package for direct funds transfer. This software is now being tested and the users trained. This is a necessary

tool for depositing staff members' pay directly into the member's bank account.

123. Treasury is responsible for normally managing an investment portfolio of $3.5 billion. This has increased recently by $4 billion related to the Iraq Gas for Food program. The Treasury has acquired a commercial package for managing these investments. There are plans to interface it with IMIS subject to the availability of resources.

124. The IMIS project and Accounts Division have provided technical support to the Treasury as the Office has no on-strength information technology and systems management expertise. **We advise that an Office as important as the Treasury requires some level of continuing IT expertise and support.**

3.13 Travel

125. The Travel functionality was implemented in 1997 at Headquarters and has been widely endorsed by the users. Some 900 travel requests are processed each month in an electronic fashion. This has completely replaced the old paper-based system and travel requests and authorizations are now processed faster and more efficiently with less burden on administrative and financial staff.

3.14 Security and Control

126. IMIS contains rigorous security provisions to ensure that only authorised users have access to data. Each user is only permitted to access the screens appropriate to that persons responsibilities on a need to know basis.

127. IMIS access security for the UN Secretariat is administered and monitored by the IT Security Unit in ITSD as part of the overall information technology access security program which permits only authorized access to UN common IT services via the UN internal Intranet and also the Internet.

128. In general, for IMIS there is one userid per individual member and that user maintains her/his own password; user-ids are only issued to persons having a valid HR index number in IMIS. The userids include an abbreviation of the corresponding department or major organization unit. Each user belongs to exactly one user group.

129. Several administrative events, e.g. override and disbursement-related, require a codeword which is different to the password. Functional packages (of authorized screens and actions) are provided at the individual and user group (collection of users who have similar administrative responsibilities) level.

3.15 Success of Usage at Headquarters

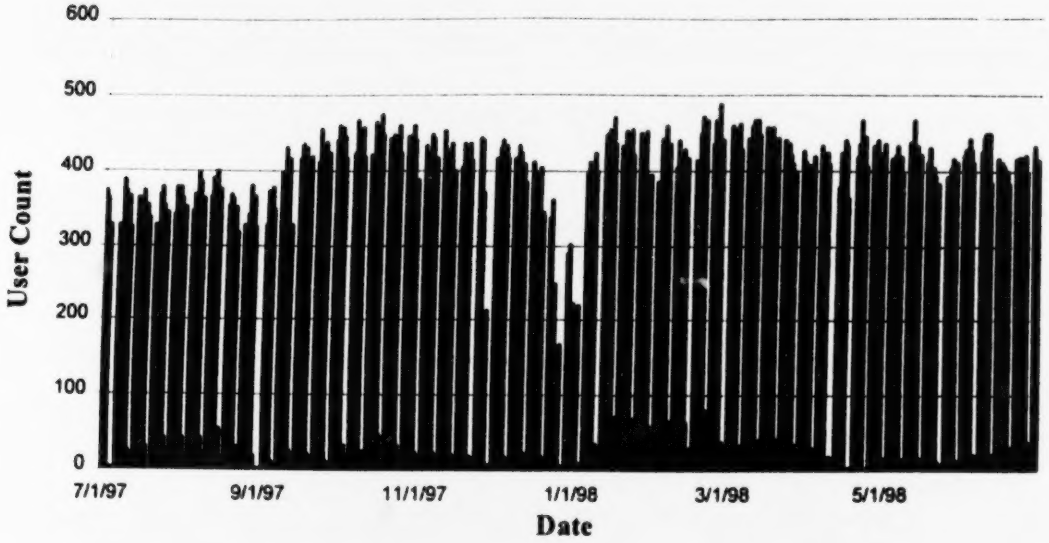
130. A large technical infrastructure to provide IMIS processing to end-users has been implemented in New York. The infrastructure is maintained by ITSD. IMIS is delivered to authorized UN users as an application on the standard desktop workstations. These desktops are part of the local area networks (LANs) which are managed and housed centrally by ITSD in cooperation with each UN Office or Department.

131. There are in excess of 1,500 individual registered users of IMIS at the UN in New York. The first chart on the following page contains an analysis of the number of distinct users who use IMIS on any particular day. Over the period July 1997 through July 1998, as evidenced in the chart, there has been an average usage of 286 distinct users per day. This figure includes weekends and the slack business period over Christmas and the New Year. The chart shows that discounting these periods the average number of users who sign on to IMIS on a normal UN working day is in excess of 400.

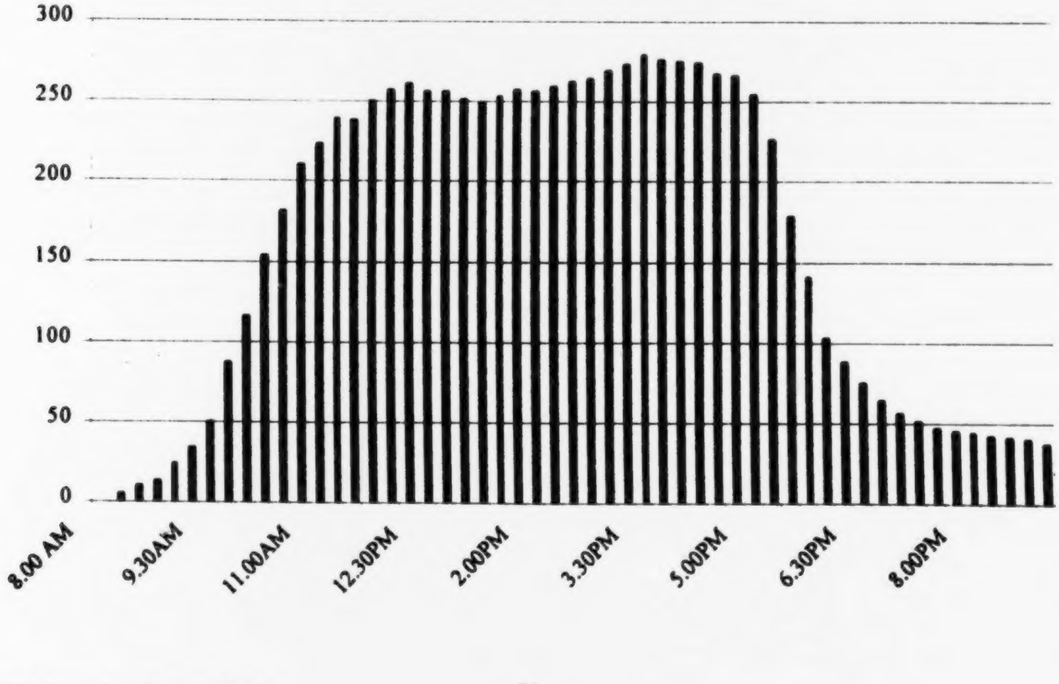
132. Another measure of the robustness of the IMIS application and the computer hardware which delivers it is the capacity of the real-time network to handle and service multiple concurrent users. A measure of the number of concurrent IMIS users on July 14, 1998, a period deliberately chosen to coincide with our study, is depicted in the second chart on the page following. This measure is made each day by the IMIS project as part of the monitoring of system performance and usage; the concurrency metric is taken automatically every 15 minutes while IMIS is running. The measurements taken and shown in the chart is typical of the normal usage profile. There is a gradual build up of users in New York throughout the morning and the level stays high through 5.00 p.m. when it diminishes markedly. The maximum number of concurrent users on July 14, 1998 was 278. We are advised that on some days the highest level of concurrent users is decidedly higher than that of the day we observed.

133. A key measure of the adequacy of the technical design is the response time of the IMIS system when processing for individual users. That is, do users have to wait unduly for the system to respond, is the response immediate, or is the response time tolerable? **In our interviews and in the focus group with users we find that at this stage of the IMIS implementation there are no overwhelming complaints about the system response.**

Count of distinct IMIS Users 7/97 - 6/98



Number of Concurrent IMIS Users
July 14, 1998



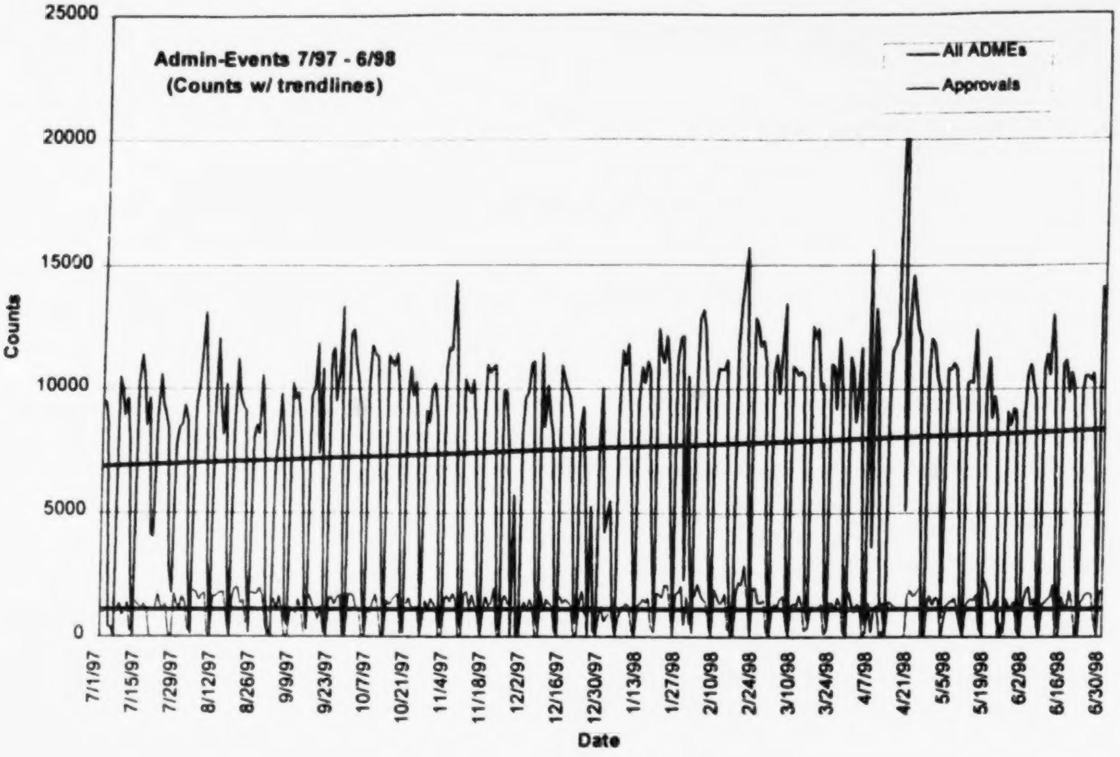
134. We were told, however, that in the past there was severe performance, i.e. system response, degradation when the Finance release was first implemented in 1996. Because of this degradation the initial release of Entitlements was taken off the system and the computer hardware in New York was upgraded to a more powerful model in order to provide acceptable system response times to human resources, finance and support services users. Since that time there have been numerous enhancements made to improve user access and the present IMIS production system is performing in an acceptable manner. As is the norm in all systems developments of this magnitude there are some program logics which inadvertently are not programmed to run in the most efficient manner. When these types of problems surface in IMIS and are brought to the attention of the IMIS Project team by the user constituencies they are addressed and, wherever possible, the particular system response is improved. For example, a new routine was recently added to provide a faster look-up of staff-members' records using the member's name. This complements the fast search routine which was provided for the general and normal search by staff member's index number. Poor system response in the current IMIS production system is likely to be an isolated incident which will be addressed by the project team when it is notified properly of the attendant problem.

135. Users should be concerned if there is a backlog of work built up because the computer system is not rapid enough to process users' inputs. We have not been made aware of any area where this might be occurring repeatedly. **We assess that the IMIS production system has adequate and acceptable response times which meet the majority of user needs and which do not universally impose significant wait times or otherwise impose a burden on users.**

136. The prime measure of the use of IMIS throughout the organization is in what it does and what the users accomplish. In the area of process inputs two sets of information were brought to our attention. The first is the number of administrative events which is processed by the system. Information for the year July 1997 through June 1999 is shown in the chart on the following page. This covers all the activities associated with human resources, accounting and finance, and support services including procurement and travel. As can be seen in the chart the trend is a steady and continuous growth in the work processed through IMIS at the UN in New York. The level of approvals of administrative events remains fairly constant.

137. Another perspective of the amount of work processed throughout IMIS is provided by the monthly tabulation of the various types of events in the areas of human resources, accounts and support services. These are given in Annex III for the month of June 1998. There were almost 2,500 personnel actions approved by authorized management personnel in the month. This demonstrates the effectiveness of the provision of management controls in the human resources function, that all actions are approved (electronically) at the appropriate level of authority.

138. There were 14,000 financial-type document transactions processed in the same month. Annex III shows the 64 different types of documents which were processed during the month. The largest document volumes were for travel requests, shipment and travel vouchers (2,600), invoices (1,800), journal vouchers (1,200) and cash/cheques (1,000).



3.16 Substantive Benefits and Improvements Realized

139. The introduction of IMIS has brought and will provide when completed numerous benefits and improvements in the substantive user areas. At Annex IV we have listed some of the benefits and improvements which were brought to our attention during our study.

3.17 IMIS Data Retrieval and Reporting

140. As is normal for large systems, due to the complex computer programming required it is not easy for end-users to retrieve data from the IMIS database (this is no different to the mainframe systems used before). For most users of IMIS information the information they require has to be obtained on their behalf by trained programming staff or by the programming of standard and special reports. Since the initial release of the human resources module in 1993 the availability of reports has continually increased. However, there is still a demand for further HR reports. For accounting and finance a large number of operational reports have been developed and released into production. Wherever possible, reports are designed and programmed in a flexible and generalized manner so that users can run the required standard report for that users specific area of

concern or interest e.g time period, location, organizational unit, etc.

141. The IMIS project team has developed the IMIS Integrated Reporting Facility Application, IRFA, to provide standard reports to authorized user and to provide a separate database for the generation of reports. The IMIS production system response time would degrade disastrously if users were allowed to generate reports directly from the production database. This is because the database is structured with priority for speed of screen display and update of the database and not for reporting from multiple data elements in the database (this is not a design flaw of IMIS; it is the design principle of all on-line databases; it is not possible to have rapid update and rapid reporting from the same database).

142. To overcome these limitations and to provide users with an appropriate reporting facility, IRFA copies the production database every night into a reporting database which is housed on a separate computer server. Thus, users can make enquiries and/or generate reports with the information as current as close of business on the previous night. Computer programs have been written to extract sets of substantive data into a file format which users can access using the standard reporting software which is used in the offices. In the UN Secretariat a majority of users use the Paradox software to generate reports. The IMIS extract files from the night before are therefore used by users in OHRM and OPPBA to generate a reports either by using some of the standard report programs which have been developed by the IMIS team or by using their own reporting programs written in various programming languages, some of which are the normal packages offered with desktop software.

143. The systems groups within OHRM and OPPBA have received training in the IRFA and, for some of their staff members, in the use of the programming language which is used to retrieve data directly from the IRFA database (which is a copy of the previous night's IMIS production database and is structured identically). These expert users in the substantive offices can provide data retrieval services for their respective offices. These are staff whose role has shifted with the coming of IMIS from making data retrievals out of the old legacy systems to now making data retrievals out of the IMIS reporting database.

144. The IMIS project team has written many standard reports for IMIS and the users have requested many more to be developed. Reports take time to program and test. **In our view, additional funds are required to complete the backlog of reports**. The numbers of reports requested and delivered is given in the table on the following page which was provided by the IMIS project team.

145. The majority of reports which have been programmed to date are for the accounts and financial areas. The emphasis and priorities at the present time is on the development of reports for the impending Payroll release where a large number of reports have been identified in the requirements. Many of these reports are required during the testing of the payroll application.

IRFA Report Statistics

Sorted by Subject Area Name within Category

Subject Area	In Prod	Not Started	Started	Totals
REFERENCE				
Accounting Reference	63	16	9	88
Entitlement Reference	1	5	25	31
Geographic Location Reference	31	0	4	35
Personnel Reference	15	4	6	25
Payroll Reference	0	8	0	8
Travel Reference	0	4	0	4
BUSINESS AREAS				
Budget	0	4	3	7
Insurance	0	7	5	12
Payroll	0	35	9	44
Personnel Administration	37	0	1	38
Post Management	0	0	0	0
Standard Financial	78	37	0	115
Standard Financial (Technical Cooperation)	0	3	26	29
Time and Attendance	0	9	0	9
Travel and Transportation	4	11	1	16
Treasury	0	3	3	6
User Security	26	1	0	27
TOTALS	255	147	92	494

146. More than 130 extracts have been programmed to date. As stated, user staff can perform their own report generation from these extracts by either using the standard reports available in the reports catalogue, or by undertaking their own computer programming.

147. In OHRM the HRMIS unit has assumed responsibilities for the provision of data retrieval services for IMIS. The unit receives a monthly reporting extract from each duty station and this is used to consolidate information on a global basis. This information is received by courier on a monthly basis due to a combination of primarily the lack of a production data communications capability and secondarily theat the data distribution functionality of IMIS is not yet developed. Within OHRM users are critical that the expectations for a consolidated global IMIS database for OHRM purposes has not been established.

148. At UNICEF in New York the IMIS database has been seen as an opportunity to populate an Executive Information System (EIS) with human resources data. UNICEF retrieves data from their IMIS reporting database extracts to input to the EIS. The organization has also programmed its own substantive human resources reports, particularly in the areas of recruitment and the skills

inventory. We understand that UNICEF has stated a willingness to share this software with OHRM and that the involved staff members are exchanging information about the UNICEF retrieval capabilities.

149. **The initial IMIS project plan was silent on the identification of the regularly scheduled and the ad hoc output reports which would be required from the production database. The cost of production of these reports was never factored into the project cost estimates as the requirements were not understood by the project planners**. In fact, it may have been tacitly anticipated that the decentralized IT groups in the substantive user areas would provide their own retrieval and reports as was the then practice. What in fact has happened is quite different to this. **The IMIS project team has provided the funding and resourcing for most of the user reports and retrievals. The requirement for reports appears to have been an afterthought in the overall IMIS project scope definition which was identified and/or realised after the implementation of the respective initial releases of human resources management, and, finance and support services.**

150. The IMIS project team provides ongoing research into finding software products and approaches which will facilitate more effective data retrieval for end-users. In particular is the need to provide easier access to the structured reporting database for ad hoc enquiries.

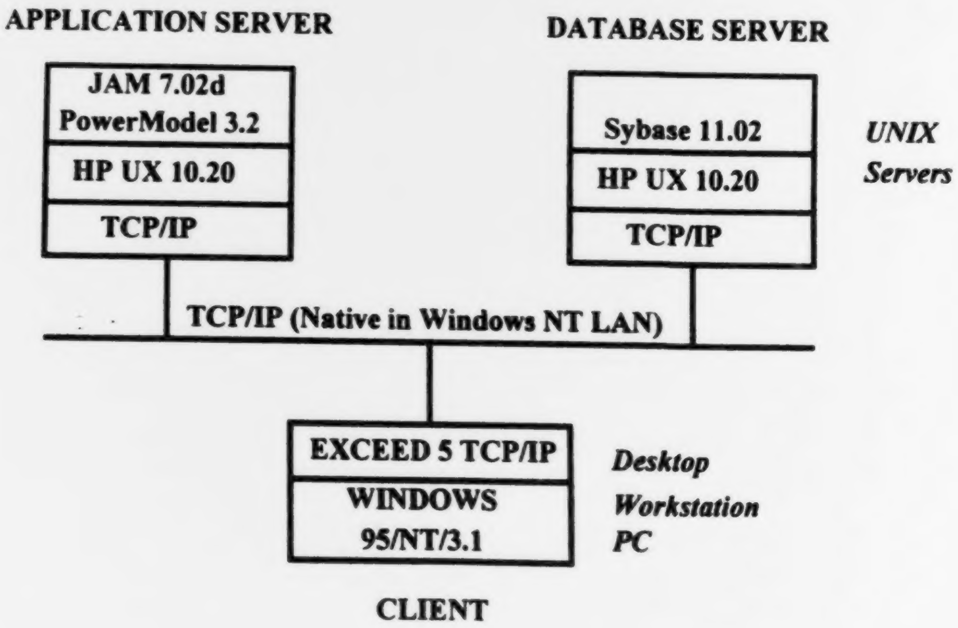
4

4 Infrastructure and Data Communications

4.1 Technical Architecture

151. The IMIS technical design is based on the client server model which has grown in prominence in the 1990's and is universally used throughout the World today. The use by the UN stems from decisions made in 1991 to adopt the then emerging technologies as the IMIS processing platform. **This has proven to be a wise and forward looking decision as it has enabled IMIS to be implemented around the World using computer hardware costing much less than those envisioned in the original project budget.**

152. The technical platform architecture is shown in the following diagram which shows the software installed on the UNIX servers and on the users' desktop PCS. The number of and size of the servers is scaled to the particular needs of each duty station and processing organization. The software products are standard at all installed sites.


APPLICATION SERVER
JAM 7.02d
PowerModel 3.2
HP UX 10.20
TCP/IP
DATABASE SERVER
Sybase 11.02
HP UX 10.20
TCP/IP
UNIX
Servers
TCP/IP (Native in Windows NT LAN)
EXCEED 5 TCP/IP
WINDOWS
95/NT/3.1
Desktop
Workstation
PC
CLIENT

153. At the outset of the IMIS detailed design it was decided that the UNIX operating system would be used. A competitive procurement process was used for the application and database servers. The Data Base Management System (DBMS) software was chosen early in the design stage for the *DATABASE SERVER*. IMIS has recently been upgraded to the most recent version of the DBMS software.

154. The application development tools (software) used on the *APPLICATION SERVERS* are :

(a) Software used for the programming the data entry and retrieval screens; the software selected by the IMIS project is a leading cross-platform tool for building client-server applications rapidly and easily while preserving the controls needed in the most complex and critical areas.

(b) Proprietary software for programming the expert system used for processing staff member entitlements. This is an Object-Oriented and Rules-based System, that offers evolutionary prototyping, rapid application development and is highly suitable for representing business process logic. The vendor is a leading supplier of business modelling products. We note that many of the largest implementation practitioners of the commercial application package which is being implemented by UNICEF for finance and accounting, use this supplier's software for implementing the financial package in a shorter time; and

(c) PERL, a programming language used for batch processing applications such as the Payroll application.

155. The on-line IMIS application has over 800 distinct user transaction screens, 3,800 context sensitive help screens, in excess of 400,000 lines of program code, and, over 2,300 stored logic routines.

156. A variety of software is used on the LANs which are operated throughout the various IMIS user communities. IMIS fits successfully into all of these environments. Three different LAN software platforms are presently in use at the UN Secretariat (to be replaced to a uniform platform in the near future). All communications across the networks use the universally used TCP/IP protocol.

157. The *CLIENT* machines are standard desktop PCs operating under the various Windows operating systems.

158. The early IMIS technical design was to have a user-friendly windowing interface on the workstation with which end-users would interact with IMIS. The generic product then available in the UNIX world was X-Windows. This was used for the initial design. However, in the 1990s Windows became the desktop standard around the world and as elsewhere, users at the UN operated their workstations under control of Windows. The IMIS project selected a product to be used to emulate X-Windows on the users' workstations. This software solution enabled the IMIS

client software to be integrated into the standard desktop. This avoided the undesirable and untenable situation of having a separate user desktop computer for the processing of IMIS.

159. A the UN in New York IMIS processes on four application servers, one database server and two reporting servers all of which are scaled to support the headquarters processing volumes. As noted, the reporting servers are refreshed each night and are copies of the production database for the previous day. There is also a disaster recovery server. The daily production input transactions are also backed-up every 30 minutes during the day. If there was a severe hardware failure on a production server the loss of data would be limited to less than 30 minutes input processing as recovery could be made to the prior evening state from the reporting database plus the daily transaction back-ups to the time of failure.

160. The OAHs have less servers than New York. UNOG has three application servers and the other OAHs have two application servers. At these sites the database server is used to process the reporting database.

4.2 Data Communications

161. The vision for IMIS spawned in the late 1980's was that the OAHs would be linked with Headquarters and with each other via high-speed data communications links. This would then permit a consolidated database to be maintained in New York which would contain the human resource records of all staff members, consultants and applicants and the key financial positions at all duty stations. This database would be an authoritative source of information required by the General Assembly and by the Administration.

162. Another strategic requirement for such data communications links is to facilitate the electronic transfer of staff members' records when they are posted from one duty station to another.

163. **At the time of our study, the required data communications links have not been established in a production mode for IMIS requirements.** There are currently global links in place which serves the administrative needs for electronic mail, optical disk access, Intranet and Internet services amongst the duty stations. **However, the needs of the IMIS project has not been satisfied.**

164. As previously noted, this has caused frustration in the user community. For example, HR data is sent from OAHs to New York monthly; users would like this to be daily. The IMIS Data Distribution release, scheduled for May 1999 requires established data communications links between New York and the OAHs.

165. Over the past several years UN, UNDP and UNICEF held joint negotiations with the SITA, aimed at reaching an agreement for the provision of SITA communications links services.

166. SITA was founded in 1949 by a group of 11 international airlines as a co-operative under Belgian law. From the beginning, SITA was assigned a not-for-profit objective by its member airlines. Nearly 50 years on, SITA has grown into the world's leading communication provider that owns and operates the world's largest, most advanced international data and voice communications network, serving more than 650 customers at close to 1,200 locations in 225 countries and territories. There are over 120,000 user connections world-wide. SITA's customers include airlines, aerospace, airports, air-freight, travel distribution and computer reservation systems and governmental organizations. Revenues were in excess of US$1 billion in 1997.

167. **The UN Administration has not closed its negotiations with SITA as a prospective provider of data communications services. We understand that discussions are ongoing to reach an umbrella type arrangement for all UN needs.**

168. Meanwhile, both UNDP and UNICEF have signed respective agreements with SITA. In UNICEF the roll-out of the PROMS application to 150 locations is being supported by the data communications facilities provided by SITA.

169. UNICEF has proven the concept of remote access to IMIS. The organization is processing Release 1, Human Resources Management in New York on servers housed in the ITSD computer room. The UNICEF office in Copenhagen is communicating on-line to the UNICEF server in New York and is performing on-line production input to the IMIS database. At present the communications line capacity restricts this operation to up to five Copenhagen users on-line simultaneously. We believe that a strategic alliance or supply arrangement with an established service provider would prove to be advantageous to the UN. The opportunities this affords in light of the possible future global demands for UN assistance and intervention are many.

4.3 Remote Connectivity and Access

4.3.1 The Issue

170. When IMIS was launched it was not planned that it be deployed to field locations. In fact it was initially conceived as a mainframe system to be installed at the eight major duty stations only. The data processing requirements for field operations at that time were also limited.

171. With the growth of peacekeeping activities at the end of 1991 and the beginning of 1992, FALD was forced to look at fast solutions for the deployment of systems in peacekeeping missions. FALD consulted with DM and the IMIS team and all agreed that there were no other solution but to look at stand-alone systems that could be implemented rapidly.

172. With the development of activities worldwide, and the increased need of integrated databases to provide management with consolidated information on the status of resources and other activities, the reliance on several stand-alone systems at each peacekeeping mission has

become insufficient. In addition, there is a growing need for allowing small locations to update data in a centralised system. Currently, there are four separate systems at each peacekeeping mission. The tribunals are also trying to find solutions to their needs and small offices being installed at various duty stations away from the main duty stations (e.g. Bonn) cannot be provided with adequate system support.

173. The deployment of IMIS as such to peacekeeping and/or small missions is not viable due to its technological requirements and "would be" operational costs. The remote access to IMIS in its current structure is however possible. UNICEF Copenhagen accesses IMIS in New York using 128K lines but only up to five concurrent users can log in. ITSD will try 256K lines. This solution is however not suitable/implementable at most peacekeeping missions.

174. The main advantages related to this solution can be summarized as follows:

(a) A single database could be established to encompass all FALD activities so that consolidated data and reporting could be available;

(b) Small duty stations and the Tribunals could access the IMIS site that is most practical;

(c) Limited infrastructure would be required for setting up access to IMIS for new peacekeeping or humanitarian missions;

(d) Less training would be required before deployment to peacekeeping missions;

(e) Local payroll for field missions could also be centralized to the OAHs;

(f) This solution would allow the concurrent usage of the system both through the WEB and in the existing client server architecture. It could provide an opportunity for the progressive re-engineering of the front-end for it to become more "user friendly" using the same architecture; and

(g) Central Management could access online remote databases to retrieve urgent information on real-time.

175. The porting of IMIS to the WEB would also be of interest to IMIS user organizations that are more field oriented. UNDP has a similar need, ILO has expressed great interest in this project and other agencies might become more interested in IMIS should this solution be available. Their financial participation into the project could be considered.

176. The technology for the remote accessing of systems through the WEB has progressed very rapidly over the past 12-18 months. One of the key components of IMIS, the front end user interface, recently brought to the market a new version for remote accessing databases through the WEB. This solution appears interesting and promising and the IMIS Steering Committee, in

1997, agreed to finance a special study to analyse whether this tool could potentially allow the remote accessing of IMIS.

4.3.2 IMIS WEB prototype

177. The vendor of the tool was contracted to do a proof of concept by porting to the WEB an IMIS users session that included the main functionalities of reading data and updating the database. This exercise was conducted in close co-operation with FALD.

178. The prototype was delivered in November 1997. Although there are still some technical issues that need to be addressed (e.g. security, architecture, wide area network response time, porting and regression testing of IMIS to the new platform), **the proof of concept demonstrated that it was feasible to port IMIS to the WEB without having to change the database structure and the system logic**. The porting of IMIS to the WEB would require the re-engineering of the front-end that could be done mostly through the one time construction of reusable objects and the automated conversion tools that have been developed and are provided with the new version of the tool itself.

4.3.3 Other Technical Opportunities

179. We are aware that the IMIS project team is currently looking at other solutions to attain similar remote access to IMIS. The technology being looked at is a thin-client solution using terminal emulation software in the remote workstation. This could be a relatively low-cost solution for remote connections. However, successful implementation of this technology requires good data communications capabilities between remote locations and IMIS Applications Servers.

4.3.4 Challenges to Successful Development of the Remote Access Capabilities

180. While the IMIS project team is convinced that the WEB solution is feasible and, in the medium term, will result in savings for the Organization, the complexity of the task should not be underestimated since technical, functional, organizational and telecommunications issues need to be addressed concurrently.

181. Neither the IMIS team nor FALD or ITSD have the financial and human resources available to undertake this project. A detailed feasibility study is required. This will need to be undertaken jointly by the IMIS/FALD teams in co-operation with ITSD, the DM Offices and, possibly with other interested agencies. The overall project including deployment to peacekeeping missions would most likely require a minimum of two years. In as much as possible, the project should be conducted with UN staff, recruited for the duration of the project, with limited consulting input mainly from the software provider. Consulting advice will most likely be required also for WEB security issues. This expenditure, however, would benefit the

organization as a whole since the WEB security issues are of general interest to the organization in the IT area.

5

5 IMIS Maintenance Requirements

182. IMIS has been implemented in the UN but there has been little restructuring in OHRM, OPPBA and OCSS to undertake activities which are not the responsibility of the IMIS Central Maintenance Unit (a unit which focuses on technical hardware and software matters). **The structures in the Offices must be adjusted to sustain the substantive maintenance and usage of IMIS in activities which are the responsibilities of the substantive Offices. Additionally, a capability to undertake administrative reform and re-engineering must also be built in.**

183. Each Office must restructure and adjust its operations to provide an adequate level of resources for manual and automated activities in the areas of:
   (a) IMIS operation;
   (b) substantive Help Desk;
   (c) Reference Table maintenance;
   (d) IMIS Testing coordination;
   (e) information retrieval, extracts and dissemination;
   (f) user substantive training, including IMIS;
   (g) methods and procedures; and
   (h) specifications for IMIS changes.

Most of these requirements are not new functions. The requirement has always existed, but has not necessarily been exercised.

5.1 Following through on Previous UN Studies

184. Over the past several years the IMIS project team has undertaken several studies concerning transitional and long-term application maintenance for IMIS. Since the initial implementation of Release 1 in 1993 the brunt of the application maintenance appears to have resided with the project team, with attendant reliance on the prime contractor to accomplish many maintenance functions. In our view, at this stage of the project and in light of the limited project funds, the

energies of the project team should be focussed specifically on developing and testing the functional capabilities and substantive applications which are yet to be delivered. **Maintenance control over IMIS releases needs to be wholly transferred to the UN as delays only serve to increase contractor dependence, costs and risks.**

185. In accordance with the request in the General Assembly resolution we have examined the skeletal plans for the long-term maintenance of IMIS, conducted in 1995 and 1996 which were provided by the project team and concur that the nature of the proposed organizational structures and levels of staffing are essential for the UN to protect its investment in IMIS and to move forward into the next century. **We find that the proposed plans, as then stated, are forward looking and are a sound starting pragmatic reflection of the needs of all parties in the UN Secretariat to contribute their specific and essential share toward the integrity and protection of the intellectual property asset which is to be found in the IMIS databases.**

186. The prior studies on IMIS maintenance were undertaken early in the overall implementation of IMIS and were based on possible scenarios for the IMIS maintenance in the various offices and units. Using the prior studies as a baseline we have revised the scope of the projections in light of our understanding of the current state of IMIS and its implementation in the various offices and units. **Each office and unit must make their own determination, based on the current status and the planned releases of IMIS, of the numbers of staff required to operate and use IMIS in their substantive areas using past studies and this report as guidelines. This applies equally to OAHs which face additional responsibilities related to the operation, maintenance, backup and security of the IMIS servers and the optimization and tuning of the IMIS databases. The IMIS project team can provide guidance and advice to substantive units on the types of technical skills required.**

5.2 Issues to be Managed

187. Maintenance of the IMIS technologies and databases is a multi-faceted challenge with which the Administration is faced and which must be addressed. The management and technical issues of concern include, but are not limited to:

(a) Governance matters

With IMIS planned for use by organizations other than the Department of Management, i.e. UNDP, ILO and UNICEF and possibly other organizations, who will decide on priorities for software changes and how will these decisions be made?

What responsibilities must be included in a Central Maintenance Unit and where should the central maintenance unit be placed?

How will IMIS maintenance budgets be determined, and what is to be included?

How will user conflicts be resolved?

Who can suggest and recommend changes to IMIS?

(b) Administrative processes

Who is responsible for prescribing and supervising the administrative processes and procedures to be followed in carrying out the functions of human resources administration, financial management and administration of support services?

Who is responsible for coordinating work-flows within and across administrative units (table maintenance, transaction processing)?

(c) Data integrity and analysis

Who is responsible for ensuring that correct data is entered correctly and at the correct time, and who is responsible for coordinating these tasks?

Who is responsible for developing reports and analysing data from IMIS?

(d) Technical matters

Who is responsible for maintaining the technical infrastructure - networks and hardware - needed to run IMIS?

Who is responsible for security administration (data, access)?

Who is responsible for data and database administration?

(e) Training and help services

Who is responsible for ensuring staff are well trained in the use of IMIS?

Who is responsible for providing functional and technical help to end users, and how will this help be provided?

Who is responsible for training staff members in the use of IMIS?

188. Maintenance for IMIS is viewed as more than just fixing software errors and making changes to improve IMIS. Instead, maintenance is widely viewed to also include supporting the operation and use of IMIS - from a substantive point of view administrative activities such as informing staff on the use of correct administrative procedure, to coordinating staff efforts in the timely processing of transactions, to providing technical and functional help to users, to maintaining IMIS tables, to controlling user access to IMIS, to safeguarding data, to keeping the

network running, to providing access to distributed data, to providing skills training, and to controlling changes. All these activities need to be carried out, but who should be responsible for them?

5.3 Scope of IMIS Maintenance Activities

189. The scope of IMIS maintenance activities includes six broad technical and administrative areas:

(a) Software maintenance

Software maintenance activities involve correcting errors in the software, modifying the software to adapt to changes in administrative policy and/or administrative procedures, and enhancing the software to meet new an/or changing functional requirements. Maintaining IMIS software involves both administrative as well as technical activities. IMIS software is planned for use beyond the Department of Management. A maintenance model to consider should be one which is similar to commercial software houses. Such a model requires strict adherence to formal software development and change control methodologies to deliver quality and contain costs.

(b) System administration and maintenance

IMIS system administration and maintenance activities ensure that the computer hardware and networks needed to run IMIS are in place and are working properly, that the correct versions of IMIS software are installed and are working properly, that IMIS data and systems are backed up, secure from all threats, and can be restored, and, that users have access to IMIS as authorized.

Administering and Maintaining IMIS systems involves both administrative and technical activities.

Many of these functions fall within the responsibility domain of the Information Technology Services Division (ITSD).

(c) Administrative methods and procedures

Administrative methods and procedures ensure that the UN operates under a consistent and correct set of administrative procedures within a framework of UN rules, that proposed changes to administrative procedures are consistent with the framework of UN rules, that administrative procedures are correctly translated into IMIS automated and desk procedures, and that these administrative, automated and desk procedures are properly documented, promulgated and followed. In other words, these activities define the "business rules and procedures" to be coded into IMIS software and to be followed by the substantive users of IMIS.

Administering methods and procedures involves both administrative and technical activities and goes far beyond IMIS.

Throughout development of the IMIS software, many of these activities were and are being performed by the IMIS Coordinators in the substantive offices. This approach was required to ensure progress in developing the software. In a maintenance mode, these activities are normally the responsibility of independent units, which are concerned with business reengineering work flows and methods & procedures, in the substantive offices.

(d) IMIS data and database administration

IMIS data and database administration include activities to help ensure that data is correctly entered into IMIS, that common data tables contain correct current values, that IMIS data tables are replicated and synchronized locally and world-wide as appropriate, that users have access to local and distributed IMIS data as appropriate to their needs and security classification, that IMIS data dictionaries are maintained, and that IMIS application software and report developers' needs for database services are met.

In essence, the responsibilities for these functions will be spread throughout the organization where the task is most appropriately positioned.

(e) User co-ordination and administration

User co-ordination and administration includes activities to help ensure that IMIS access rights are assigned according to user security classifications and user administrative responsibilities, that correct data is entered into IMIS, that common data tables are updated and validated according to published schedules, that users have access to needed IMIS reports and data for administrative control over UN resources and for planning, that IMIS work flows are coordinated across administrative units, that administrative transactions are entered in a timely and complete manner to improve overall efficiency in delivering administrative services, that users are trained and knowledgeable in UN administrative procedures and IMIS desk procedures, and that administrative issues and concerns regarding administrative work flows, coordination, efficiency improvements, processing schedules and desk procedures are identified and actioned.

For the UN, these responsibilties fall within the mandates of ITSD (for security and user access control) and the substantive user Offices and Departments.

(f) End user support

End user support includes activities to help ensure that IMIS end users are supported in their efforts to use IMIS in processing administrative actions and transactions, and in accessing and analysing IMIS data, and that end users concerns, needs and ideas for improvement are given a forum for discussion and action. End user support should be focussed in each substantive area to the particular functional needs of that area.

The responsibility for providing this level of support lies with the substantive Offices and Departments.

5.4 Organizing for IMIS Maintenance

190. **IMIS is an integral part of the substantive work of UN units which cannot be separated from the overall substantive policies and operations.** IMIS maintenance needs to be conducted according to the same international quality standards for reliability, correctness and performance demanded of commercial software developers. Managing the IMIS investment to obtain its full benefit requires a strong central IMIS Maintenance Unit. The proposed mandate of this unit focuses on improving, enhancing and supporting the IMIS software through fully documented software upgrades and releases and through technical support and services delivered through an IMIS Help and Service Desk.

191. **Responsibility for the UN's administrative business processes, including those that are programmed into IMIS, and responsibility for maintaining desk procedures including those that are used with IMIS is presently an organizational void. Each substantive office must have its own Methods and Procedures staff to fill this void.** Responsibility for providing functional help to users operating IMIS is seen as belonging to first level supervisory staff and ultimately to functional Methods and Procedures coordinators within the Office. Within the Office the Methods and Procedures staff would be part of the Policy & Systems Unit (see also section 5.6.4).

192. Developing reports from IMIS data is proposed as a shared responsibility between the IMIS Maintenance Unit and Users. IMIS has been designed to provide flexible ad-hoc end-user reporting tools to meet immediate needs; and in this regard, the role of the IMIS Maintenance Unit is to ensure that appropriate reporting databases are maintained for users to access. A report development function is recommended for the IMIS Maintenance Unit, to develop new reports integral to IMIS software releases, and to provide technical support and assistance to users developing ad-hoc reports.

193. Ensuring effective and efficient use of IMIS is a central responsibility belonging to each major administrative function (OPPBA, OHRM, OCSS). Systems Coordinators within Policy & Systems Units are proposed for monitoring the use of IMIS and for coordinating IMIS table maintenance. **These proposed units should report directly to their respective Assistant Secretary-General.**

194. An Inter-Agency IMIS Governance Board is proposed for keeping control over demands for system changes by assessing the merits of major enhancement requests against established criteria. In developing major enhancement requests, consideration should be given to using a standard business case format that identifies benefits in terms of cost savings and/or cost avoidance and/or service improvements as well as identifying technical and functional impacts and estimated costs. The Governance Board should operate within the overall governance framework for IMIS. The governance framework must represent the collective interests of user organizations. At the present time these are UN, UNDP, ILO and UNICEF.

5.5 Performance Targets

195. IMIS should be capable of being changed immediately to fix critical errors, quickly to accommodate changes in administrative procedures and less quickly to implement new functionality. In this regard, the assumptions driving the maintenance organization include:

(a) IMIS Critical Patch Releases - critical errors requiring programming changes to be fixed within 2 - 5 working days;

(b) IMIS Interim Releases - containing changes resulting from changed administrative procedures and changes resulting from fixing non critical errors, to be available within 3 months; and

(c) IMIS Functional Releases - containing new IMIS functionality, and containing changes to IMIS functionality, to be available within 6 to 12 months.

196. The following table summarizes the "target" IMIS Release Schedule.

	Frequency	
Critical Patch	As needed, within 2-5 days	Correct Critical Errors
Interim Release	Quarterly	Procedural changes, non-critical errors
Functional Release	Annual	New functionality, procedural changes, non-critical errors

197. To illustrate the nature of an interim release we have attached at Annex V the production upgrade report which was issued to IMIS users with the implementation of a software enhancement release in July 1998. This shows the wide range of enhancements which were then implemented in response to user requests for enhancements, and, the identification of

programming logic errors and problems with application functionalities.

5.6 Guidelines for Determining Staffing Levels

198. Based on the preceding statements concerning the scopes of IMIS sustainment activities and on our understanding of the issues involved, guidelines for determining the staffing levels required for the operation and use of IMIS are identified below for the UN Secretariat units and for the OAHs. **Each office or unit must prepare and effect staffing plans to meet its own substantive responsibilities and requirements for the operation, maintenance, continued development, sustainment and use of IMIS within their substantive theatre and for the appropriate management of those responsibilities. This will entail the reallocation of functions and resources as responsibilities change or are reassigned.**

5.6.1 Central IMIS Maintenance Unit

199. IMIS is designed to be a single system which serves the needs for administration at many UN duty stations. Each site will have an identical copy of IMIS. The system is also designed to be a fully integrated system, in which several units may share the same data. In addition, the UN has made IMIS available to UNDP, ILO and UNICEF for their use and will continue to offer it to other UN organizations. These organizations have contributed funds to the development of IMIS for their own usage and for the common good of all user parties.

200. The maintenance implications for IMIS include a central maintenance unit in charge of maintaining and upgrading software applications and for continuing technical research and developments. The unit controls work on a project basis, with all enhancements and fixes assigned a control number for tracking purposes. Principal goals of the unit, as proposed initially by the Prime Contractor and confirmed in further studies are to:

(a) maintain the IMIS application and supporting materials in highest working order;

(b) carry out an orderly development process for implementing approved functional and technical changes to IMIS; and

(c) respond to user needs for maintenance, including fixing errors and developing new features and functions.

201. The unit requires to be organized and staffed with the following technical function sub-units:

(a) Customer Support (IMIS Expert Help Desk, Report Development, Tables Administration);

(b) Release Development & Maintenance (Analysis, specifications, programming, testing, documentation);

(c) Technical Support (Data Administration, Configuration & Installation Support, System Administration for Development Environment); and

(d) Administrative Functions (Change Control, Quality Assurance, Secretarial Support).

202. **The absolute definition of an appropriate long-term maintenance unit for IMIS cannot be undertaken at the present time, as such a process must be driven by the governance process for IMIS.** The governance process will be discussed later in this chapter. Suffice to say at this point that the maintenance organization must be positioned and resourced to take into account the needs of all partners and stakeholders. In this respect, IMIS has progressed from being solely a UN Secretariat system to being one which is also used by UNDP, ILO and UNICEF, also to service other entities such as UNOPS and UNFPA.

203. Notwithstanding the preceding point, past studies on IMIS maintenance covering only UN usage have suggested a model which we feel is a good indication of an appropriate organizational model, which requires, of course, tailoring to fit into the long-term governance regime. The organizational structure previously suggested is consistent wth the organization of the present IMIS Project as depicted in Section 2.2 preceding.

5.6.2 Transitional Maintenance Strategy

204. **We see the major challenge facing the UN, UNDP, UNICEF and ILO over the next 18 months to be getting the financial and payroll releases working accurately and reliably prior to the year 2000.**

205. At the same time there are ongoing enhancements which are required by the UN and which will not necessarily be made under existing contracts with the Prime Contractor. These enhancements should be done over the period of the next 18 months and put into use at Headquarters and at OAHs as they become available.

206. For all users (UN, UNDP, ILO, UNICEF) there is an identified need to enhance the HR functionality to include:

Retroactive Personnel Action;
Rescind Personnel Action;
Multiple Personnel Actions; and
As-of Reporting.

These enhancements are being made by the programming staff in the IMIS team on a phased basis and will be implemented when ready over the next 18 months.

207. There is a requirement for one additional analyst/programmer in the team with expertise in the IMIS on-line programming language. This is to provide a strong capability in the UN team when the Prime Contractor leaves the project.

208. There is a requirement for three additional analyst/programmers to work on finance and payroll maintenance for the UN when the Prime Contractor leaves the project, and to work on enhancements which have been requested, but which have been deferred by the Project Steering Committee due to lack of resources and the needs to address higher priority requirements.

209. As noted previously there is a large backlog of reports to be developed for the UN. Some of these are relatively urgent as they are required for payroll production processing. It is estimated by the IMIS project that funding of $1 million is required to hire staff and contractors to work on the reports over the next 18 months.

210. Not included in these transition phase resource estimates is any funding which might be required by UNDP to complete its finance release implementation.

5.6.3 System Administration and Network Support Unit (within ITSD)

211. ITSD provides these services for the UN Secretariat and IMIS is an additional product to be supported, similar to other enterprise-wide activities. The range of corporate products maintained and delivered by ITSD covers e-mail, Internet. Intranet, Office Automation standard desktop software, LAN operations, and IMIS. The services cover the following activities:

(a) Network Management (Wide Area and Local Area)
Develop and administer network service level policies and performance standards for hardware, network operating systems and network management tools. Monitor IMIS system and network performance, maintain IMIS asset inventory database, maintain database of current IMIS system and network configurations, install, configure and upgrade production networks (WAN and LAN) and internetworks to support the synchronized operation of IMIS in New York and worldwide, diagnose, troubleshoot and correct hardware and network errors:

(b) Security Administration
Administer IMIS physical and systems access security measures, administer IMIS user accounts, IMIS disaster recovery plans;

(c) Systems Administration
Develop and administer IMIS data and systems back-up and recovery procedures, install, configure and upgrade production IMIS application and database servers, install and upgrade IMIS software releases on production machines, diagnose, troubleshoot and correct IMIS software installation errors, test and configure new hardware for use as production machines for IMIS, configure and test upgrades to and

new network and system operating systems for use with IMIS; and

(d) Help Desk Services
Provide end-users with technical support in operating their workstations and accessing UN automated systems and tools, in troubleshooting problems, in escalating problems to the appropriate authority and in closing problem tickets. The Help Desk services is contracted out. The call centre is physically located in Pennsylvania. For IMIS users these Help Desk services will generally focus on network and LAN problems. Help Desk services for substantive matters must be provided by the substantive Office.

212. ITSD, to support IMIS for UN, UNDP and UNICEF, uses:

1 DBMS software Analyst;
1 UNIX Analyst; and
1 Software Distribution Analyst.

It is emphasized that these resources are essential to support the IMIS mission critical system and to protect the corporate investment in intellectual property.

5.6.4 Policy and Systems Units (within OPPBA, OHRM, OCSS)

213. **A Methods and Procedures function must be established in each Office, under the Policy and Systems Unit to strengthen the ability of the Office to effect new and revised substantive administrative policies and procedures commensurate with substantive process reforms, and to translate whereever applicable into IMIS functional procedures which can authoritatively be forwarded, within the overall IMIS governance framework, to the IMIS Central Maintenance Unit for systems development and or modification.** Specific responsibilities for the proposed substantive Methods and Procedures Unit(s) include the following:

(a) analyse, assess and report on feasibility of proposed substantive reform and re-engineering initiatives, new substantive administrative procedures, and proposed modifications to existing administrative procedures

(b) translate proposed and official substantive administrative procedures into IMIS functional specifications and desk procedures wherever required

(c) develop and implement a communication plan to advise and train substantive administrative staff regarding current substantive administrative procedures, IMIS-related and not

(d) provide functional help to substantive administrative staff in following IMIS desk procedures.

214. Policy and Systems Units within OPPBA, OHRM and OCSS are proposed to include the general functions of:

(a) Policy Coordination
Develop and administer procedures for granting IMIS access rights and changes to access rights, develop and promulgate policies and procedures for the coordination and supervision of administrative work flows, develop and implement procedures for identifying and considering requests to change IMIS, approve training requests in administrative and desk procedures; and

(b) Systems Coordination
Coordinate and monitor administrative work flows, identify new business systems requirements, coordinate IMIS table updates, develop user requirements for IMIS reports and database extracts, identify and assess user training needs in administrative and desk procedures.

215. Each substantive Office must provide substantive Help Desk services for staff members for all activities and procedures delegated throughout the Organization (of which IMIS is one set of functions). Users of IMIS must have an informed source to consult on how to use IMIS in the course of substantive administrative activities.

216. The minimum staffing levels for Policy & Systems in each Office (OPPBA, OHRM, OCSS) will vary, depending on the business levels.

5.6.5 Training Unit (within OHRM)

217. OHRM must ensure that IMIS training is provided as part of the UN training offerings. The minimum staffing requirements to fulfill this responsibility must be determined by OHRM.

5.6.6 Minimum staffing needs for OAHs

218. Staff are needed at UN Offices Away from Headquarters to conduct the same substantive and IMIS-related activities as in New York, except what is to be performed for all users by the Central IMIS Maintenance Unit.

219. Each OAH will need to identify how these activities are best integrated into their organizations and the staffing levels required.

5.6.7 Summary of UN Organizational IMIS Maintenance Requirements

220. This chapter suggests the minimum activities needed to maintain and support the operation

of IMIS and to provide systems and procedures to develop and implement substantive reform initiatives. **Each Office and OAH must plan these activities in relation to substantive and operational responsibilities, and must determine the net resources required within their organization to staff these activities.**

5.6.8 Guidelines for Maintenance Responsibilities

221. We have included at Annex VI guidelines for the maintenance responsibilities of staff members in the several units identified. For the IMIS Central Maintenance Unit these responsibilities allude to the previously cited long-term organizational model.

5.7 Inter-Agency Governance Framework

5.7.1 Several Players at the Table

222. Several convincing arguments can be put forward on the need to focus attention on the long-term governance structure for IMIS. **The success of the system as operationally robust and in satisfying administrative and accounting needs is confirmed by the present use in UN Secretariat, UNDP, ILO, UNICEF, OAHs and the planned completion of roll-out in those organizations.** The first four organizations have cooperatively contributed funding over the past several years to generalize the product to meet the common requirements of all organizations. These organizations need to participate in the management of IMIS, a place at the management table, as their administrative processes and financial operations will be wholly dependent on IMIS. They also have, in common, needs to leverage the investments to date in IMIS and to develop IMIS further to provide adequate administrative and accounting support processing to units deployed in the field.

223. **Although the UN Secretariat was formerly the only sponsor and champion of IMIS, and remains the major player, the participation of the other organizations is to be recognized in the future management and directions of IMIS. The pertinent issue here is where will the ownership of IMIS lie in the future?**

5.7.2 Formal Participation of Inter-Agency Substantive Forums

224. A further perspective and arising issue for the sound and proper governance of IMIS is that there must be appropriate arrangements in place to foster forums to represent parties with the same collective interests. We have noted during our study that IMIS has resulted in being a catalyst in bringing together management from the same substantive areas in differing organizations to discuss substantive business rules and how they shall be interpreted and translated into IMIS. Inadvertently, the introduction of the computer system and the general approach of consistently applying one set of rules for all users, has lead to healthy challenges to

what the rules should be. And, there is an exchange of ideas and information concerning work flows and output reports which could be common to all.

225. This suggests that **the IMIS governance framework should recognize the constituency of cross-organizational user groups which champion and recommend the respective substantive functionalities to be included in future releases of IMIS.** Not only will this foster cooperation between parties with common interests in different organizations, it will also have the added advantage of putting ownership of the future IMIS where it is best be placed, with each distinct substantive user constituency. The groups should also play a part in developing a business case and funding strategy for significant IMIS development efforts. Examples of user groups which could be set up immediately are human resources management, accounting and finance, treasury, payroll, support services, and, information technology. In fact, these user groups could provide advice to, intervene or otherwise interact with the substantive working groups or task forces which are struck to deal with substantive policy and matters of common interest. They could also work cooperatively amongst themselves where warranted; for example, the subject of changing an entitlement rule is of concern to human resources, payroll and accounting.

5.7.3 Termination of the Prime Contractor Participation

226. The existing contract with the Prime Contractor will end in 1999 when the Data Distribution release is delivered. At that time all of the five releases will be accepted for completion of the roll-out to all OAHs. In fact, there will be a run down of the Prime Contractor staff from the project as the several ongoing developments are completed. The enhanced release of Finance will be delivered at the end of 1998 and the Payroll release is scheduled for delivery in early 1999. It is anticipated that many of the Prime Contractor staff will be leaving the project by the end of January 1999. The sudden reduction of this level of support, which has been available over the past six years and which could always be conveniently mobilised for out of scope or other needed activities when required, will no longer be at hand. **There is a compelling argument for all parties to agree on a management framework and an organizational arrangement to cope expeditiously and effectively when the Prime Contractor is no longer under contract and on-site.**

5.7.4 Common Service in support of announced UN Reforms

227. In our view, in the long term a properly configured IMIS could be a common service offering to provide the foundation of administrative processing and financial operations in support of the Secretary-General's reform initiative. As we understand, one of the concepts is to consolidate member organizations' presence at a geographic location in one building or facility, notionally referred to as "UN House", and that the participating organizations at that location will share common services. IMIS is an obvious tactical choice as the base platform for providing a common service for human resources management, finance and support services and payroll systems. The human resources and payroll already meets the needs of most UN organizations and

the finance module meets the requirements of two organizations and would require upgrading to the financial needs of other organizations.

228. In the same vein we extend this argument by asking what will happen when different field organizations are brought under the same roof. The organizations will fairly easily be able to amalgamate the local organizations to use common services such as the same human resources services group, payroll group, financial and accounting services, telephone system, administrative and support services, and local area network etc. But it will be much more difficult to bring this about if each organization continues to process its own set of substantive legacy computer systems which are tied to their own "corporate headquarters" in New York, Geneva or elsewhere as the case may be. **This most probable problem, which is an impediment to the orderly transition to the UN House, can be reduced and in fact avoided if more UN organizations were to adopt IMIS for their substantive processing applications.** For maximum benefits and efficiency there would then be only one processing computer system in each location. Further, the application would be standardized world-wide and staff moving from one location to another or transferred between organizations would be familiar with the administrative tools used at all points of service delivery throughout the UN system.

5.7.5 Field Office Version of IMIS

229. Many UN system organizations have field offices and some of these have undertaken to install computer applications to their offices on quite a large geographic scale. UNHCR has put their FMIS in over 280 field offices and UNICEF is in the process of putting their PROMS into 150 offices. Field organizations tend to have requirements which are somewhat different from those presently being addressed by IMIS (which are focussed presently on Head Office needs). They are project oriented and the field offices have approaches to delegation and controls which are different to those presently represented in IMIS. Practical issues also include the distance from headquarters, availability and adequacy of technical support and their retention, adequacy of data communications, and, the synchronization of software releases.

230. **The most recent technical research undertaken by ITSD and the IMIS Project indicates that it may be possible in the near future to provide a low-cost solution to providing remote connectivity to IMIS for field offices. For field operations to use IMIS may require some minor design changes.** Some of the requisite tools have been alluded to in the prior section on remote connectivity and access in Chapter 4.

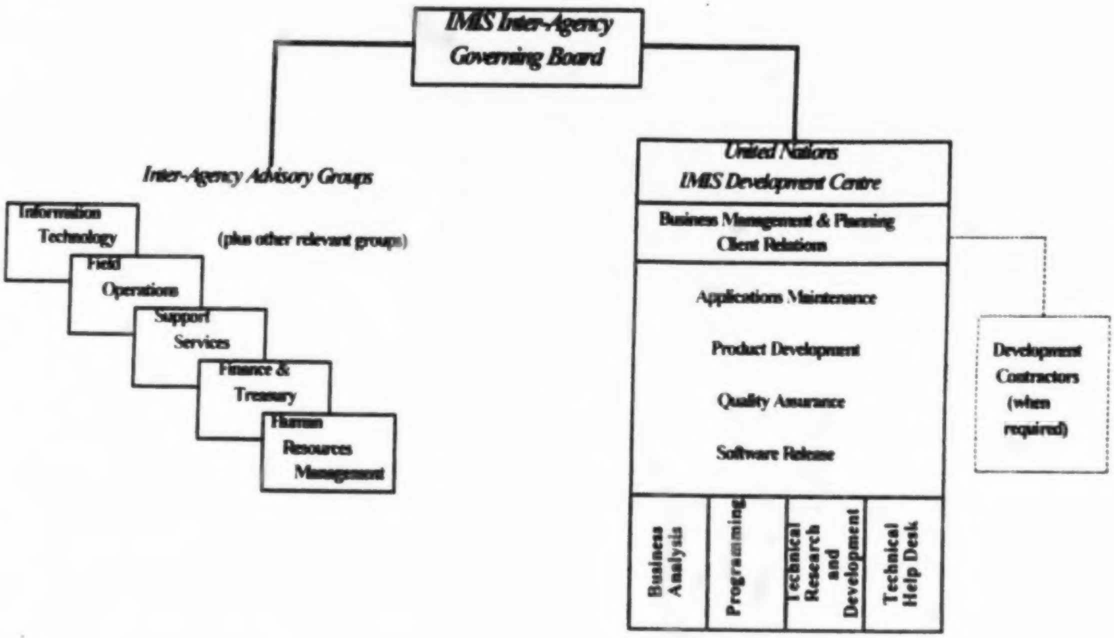
5.7.6 A Governance Concept

231. Discussed immediately preceding in this section are the recognition that there are several players at the table, the need to formally involve inter-agency substantive user groups in the governance structure, the matter of the Prime Contractor's participation in IMIS terminating imminently, the need to provide a common service in computer support for the "UN House"

reform process, and, the continued investment necessary to develop a field version of IMIS.

232. An organizational option for a long-term IMIS governance framework is depicted following. This is not a flushed out recommendation, but we put it forward for consideration as to how the needs of all stakeholders can be taken into account.

A Framework for IMIS Governance


IMIS Inter-Agency Governing Board
Inter-Agency Advisory Groups
Information Technology
Field Operations
Support Services
Finance & Treasury
Human Resources Management
(plus other relevant groups)
United Nations IMIS Development Centre
Business Management & Planning Client Relations
Applications Maintenance
Product Development
Quality Assurance
Software Release
Business Analysis
Programming
Technical Research and Development
Technical Help Desk
Development Contractors (when required)

233. We envision the IMIS Development Centre as being positioned to provide continuing services to participating members. The centre would be funded by agreed-upon assessments from participating organizations. The levels of assessment would be based in some way upon the relative use of the various applications releases and services offered by the centre. These assessments would be made several years in advance in the business planning process in order for participating organizations and agencies to include the proposed expenditures in their budget submissions.

234. A key performance measure for the governance of IMIS is that there be effective substantive ownership, that related sets of users across all participating agencies feel that they are involved in and responsible for the definitions of requirements and the implementation of the system according to their needs. Another way of stating this is that users must collectively and concensually have a voice in saying what they need IMIS to do for them and they must feel that IMIS is a common service in their substantive area to the benefit of all. Our model governance

framework shows how this can be done by establishing Inter-Agency Advisory Groups in the several areas of substantive interest. These groups would champion the business changes to be delivered through IMIS and would advise the Inter-Agency Governing Board on matters such as the overall computer system adequacy and performance, and, recommendations for changes and new initiatives.

235. The IMIS Development Centre must be established such that staff members enjoy full protection of their rights as employees of the United Nations, including career advancement and mobility.

6

6 Conclusions and Recommendations

6.1 Conclusions

6.1.1 Project Accomplishments

236. There is no doubt that IMIS is a well designed and robust computer application which is providing functional support to a large number of users in New York at the UN, UNDP and UNICEF. At the OAHs and ILO the application is not presently as advanced as New York in its implementation. The usage statistics for the UN in New York and the overall project status, which are described in detail in chapter 3, confirm that the system is used satisfactorily by a large number of users with differing substantive interests. In excess of 400 different users access IMIS at the UN in New York each day, and at peak times there are in the order of 300 concurrent users.

237. The goals of developing a truly integrated system to interlink the various functionalities and share common data have been realized by the IMIS design. The extent of systems integration which has been accomplished by the UN through IMIS married with the empirical evidence of emerging trends in systems acquisition as cited by industry authorities such as the Gartner Group confirms that, according to today's benchmarks, the original vision and design goals for IMIS was ahead of its time. In our view, there is no presently available commercial software which offers the full extent of integration of UN administrative and business data as that provided by IMIS. It is also our view that some years will elapse before a similar capability which could reasonably meet the UN's administrative and business requirements will be commercially available.

238. IMIS has been successfully integrated with commercially available software for use in specific areas. Examples can be found in the use of these packages for procurement, cheque writing and direct funds transfer. The judicious use of packaged functional solutions has reduced development time and costs.

239. Implementing IMIS has been a difficult process within the organization. The organization has overcome many barriers toward a successful implementation. The most prominent hurdle

which has been overcome is the lack of available resources on the development team and in the user areas. For all of the major releases, the UN had few resources to participate in the user testing and subsequently the loading of the data. This was due to the increased demands on the Organization to provide support to missions away from headquarters throughout the 1990's and the series of staff reductions which the organization went through. The situation was that when the computer system releases were ready to be used the primary user organizations, both OHRM and OPPBA, had few resources to adequately test the system and to load the data.

240. The lack of directed resources within OHRM and OPPBA contributed to the extended and unanticipated implementation delays of Releases 1 and 3 at Headquarters. For both of these functional releases the offices assigned an insufficient number of staff to the implementation of IMIS. Consequently the IMIS project used the prime contractor to provide assistance in data cleansing; this type of expenditure was never envisioned in the original project budget submission.

241. A major accomplishment is that IMIS has not failed like many similar IM/IT initiatives elsewhere. Many Member States can identify with project failures which have occurred within their countries. Industry research points to the fact that over the past decade failure has been as likely as success in large information systems projects development. Although the IMIS development process has been overwhelmingly long the final product, often after some false starts and disappointments when the software release is first delivered for testing and implementation, is a successful delivered working system for the releases made to date. Corrections to problems have progressively been made and users can cope with the present systems until all of the requested enhancements are made.

242. The development and implementation of IMIS has been accomplished by a relatively small IMIS project team. We perceive in the IMIS team an exceptional dedication to making IMIS a technical success. Staff members regularly work extended working days as a matter of course. In this team, long days appears to be the norm. As indicated in the Independent Experts Report on IMIS of 1992 a project with a scope as large as that of IMIS would normally have a much larger project office than that constituted in the IMIS project team which presently has 37 staff members dedicated to both the coordination of development and implementation and to the maintenance and enhancement of the releases which are in production.

243. For the first time in two or three decades the business rules of the UN's administrative, human resources and financial systems and their application are adequately documented. Maintaining the UN computer systems and business work flows documentation current had been grossly neglected in the past. The IMIS project has delivered computer applications and business processes which are now properly documented. The lack of up-to-date and informative documentation of the legacy systems and the business processes involved resulted in incomplete or inaccurate initial business specifications for IMIS. This was one of many contributing factors to the subsequent late delivery of the IMIS application and the need to spend additional funds on computer programming.

244. A comprehensive reporting capability has been put in place to enable end-users in the substantive offices to generate their own reports with the most recent available data. Centrally, many reports have been written for end-users. Work is ongoing to address the backlog of reports which have been requested by users. The extensive need for reports was not anticipated by the initial project planners.

245. In New York the technical operations and services required by UN users to access IMIS are well provided by ITSD. ITSD houses securely, maintains and operates the IMIS hardware servers for UN, UNDP and UNICEF.

6.1.2 Project Investments

246. The UN's development and implementation budget to date for IMIS is in the order of $68 million. Of this $42 million is for contractor services and $19 million is for staff assigned to the construction. These costs have been incurred since 1989. Based on our own experiences in management of the systems development process we find this level of investment reasonable for the outputs which have been produced. Many comparable IM/IT projects in the public and private sectors, both successful and failed, have cost far more than the budget of IMIS. Not many will have cost less.

247. Additional funds have been spent by UNDP, ILO and UNICEF on the development for and the implementation of IMIS in those organizations. The levels of funding spent by those organizations is far less than they would have had to pay to develop their own computer solutions or to implement some other commercial "best of breed" or integrated solutions. The UN's investment in IMIS, some $68 million so far, should be viewed in the context of the funding of a computer application for UN, UNDP, UNICEF and ILO. Cost avoidance to the UN family has been afforded by the initial UN investment in IMIS. Further savings can be realised if additional UN family organizations adopt IMIS as the basic platform for their business solutions.

248. Additional cost avoidance has been attained by using IMIS to circumvent having to make legacy systems Year 2000 compliant at the UN, UNDP, ILO, UNICEF and the OAHs. We conservatively estimate such savings to collectively exceed millions of dollars for the human resources management, finance and accounting, and the various support services applications.

249. The legacy systems of the UN are in many instances 20 or 30 years old. The funds initially invested in those applications was well placed when the life of the application is considered. We are of the view that there are no reasons why IMIS should not have a useful life of in excess of 15 or more years. Over such a period this would equate in simple terms to an annual investment of less than $5 million to provide the computer software to the full set of user organizations.

250. The project maintenance costs of IMIS to sustain core functions are budgeted at $9.8 million for the present biennium, as detailed in chapter 2. It is cost beneficial to share this cost amongst many participating organizations.

251. During our study we have detected concerns that, today, commercially available packages are a viable and less costly alternative to implementing IMIS. Such packages were not available when the IMIS project was initiated (the original plan was to obtain and modify the systems which had been developed by the Food and Agriculture Organization in Rome).We believe that a valid business case analysis for UN organizations considering commercial solutions as an alternative to IMIS will challenge the precept that such solutions are less costly. We have discussed this issue in chapter 3. Experiences in the government and private sectors show conclusively that the entry costs to fit and use some "off the shelf" packages are much higher than expected, even under a shared systems regime. The costs of implementing packaged human resources and financial solutions is consistently over budget in organizations which are installing these packages. In addition, many such organizations initially implement only the essential "must have" basic functionalities. In subsequent phases further expenditures are required to implement some of the extended functionalities which have not initially been implemented. The highest cost component is the fees for consultants. Some Member States will no doubt find such experiences in their own government jurisdictions at the national, state, regional, municipal and local levels.

252. The overall costs to the United Nations might have been reduced, perhaps considerably, if Member States could have donated appropriate useable or modifiable functional software to the organization.

6.1.3 Technologies Deployed

253. We conclude that the IMIS technical architecture is well designed and that the production system is robust. Computer hardware is upgraded when required to meet the processing volumes of the various user organizations. The technologies used are widely used in the information technology industry. In chapter 4 we have discussed the technical aspects of IMIS.

254. In our interviews and in the focus group with users we find that at this stage of the IMIS implementation there are no overwhelming complaints about the system response at the UN in New York. We assess that the IMIS production system has adequate and acceptable response times which meet the majority of user needs and which do not universally impose significant wait times or otherwise impose a burden on users. We believe that there should be no concerns about the system capability to respond to users. In the past, response problems have been addressed and corrected when brought to the attention of the IMIS team. Such problems are generally isolated incidences.

255. Some users, particularly expert ("power") users, comment that the screen navigation to accomplish certain business transactions is cumbersome, that the user must process through too many screens. Improvements could be made in some of these instances. However, this would require reprogramming and funds are not available for this purpose. Overall, screen navigation design is optimized to meet the wide variety of business transactions. Albeit, improvements in screen navigation is being phased in on an ongoing basis.

256. In the same vein some users state that the system should be more user friendly when operated at the desktop workstation. The windowing technologies universally available today and which are widely used at the desktop were not as prominently available seven years ago when the design of IMIS began. There are software tools available which can automatically convert the existing screens to a more acceptable graphic user interface presentation. Funding would be required to do this. The proof of concept for this has been demonstrated by the IMIS project team in its study on remote connectivity using the Intranet and WEB-based technologies.

6.1.4 Lessons Learned

257. In all systems development initiatives some things go well and other things are done or addressed not so well. We have talked about, above, some of the accomplishments of the IMIS project and we have written about these in detail in the body of this report. There were many areas where, for one or for several reasons, major hurdles and difficulties were encountered in the management of the project. These also have been described in the body of the report. We recap following, in summary form, some of these situations in concert with some of the underlying causes, in order that the difficulties which were overcome, the severe project slippage, the increase in the project budget, and, the accomplishments made, can be viewed in light of the changing UN environment and circumstances in which the project has operated.

258. From the outset the project faced severe challenges due to the changing user environment. As noted, the increased demands on the Administration to provide support to missions away from headquarters throughout the 1990's and the series of staff reductions which the organization went through left few knowledgeable resources to confirm the initial computer program specifications, to adequately test the delivered releases, and to load the data. The availability of skilled substantive personnel for full-time participation in testing and development is a critical factor for the success of large IM/IT development projects. A case in point: Release 1 was delivered by the contractor in April, 1993. OHRM did not have available resources to assign to the implementation taskings. The Prime Contractor was asked to assist and provide implementation assistance.

259. All organizations need additional resources in the user areas when new computer applications are being developed and implemented. This does not appear to have been understood and appreciated or the consequences of the impact on the IMIS project taken into account when the UN staff reductions took place. These reductions coincided with the increase in Peacekeeping missions in the 1990's which usurped management resources away from Headquarters. This combination of environmental circumstances and management directions imposed severe consequences on the project schedule, and in response to these events the IMIS project engaged the contractor at additional cost to do much of the data cleansing and loading. Over the duration of the project there has been a heavy reliance on the contractor for conducting implementation activities which would more properly have been undertaken by UN substantive staff, had they been available.

260. The initial project planning did not anticipate the full scope of the project. It is doubtful that

the planners conceived or understood the magnitude of the task to be undertaken. This stems partially from the fact that the old legacy business processes and computer systems were inadequately documented and not understood, leading to an underestimation of the magnitude of the computer programming task. Additionally, IMIS had a much broader scope than the existing systems. The planners also failed to identify the need for additional UN resources to cleanse the data which was to be loaded into IMIS. They did not appreciate how inaccurately and incompletely human resource records had been maintained in the 1970's and 1980's. Consequently these items were not included in the original project costs estimates.

261. Likewise, the project planners underestimated the workload in the programming of reports in their initial plans. This has been quite an expensive task and there is a large backlog of reports to be programmed. The present focus is on writing reports to support the imminent payroll release. In the early release of the finance and accounting software there were very few reports and diagnostic tools available for processing and monitoring accounting operations. This set back the overall implementation process in New York. The problem has progressively been rectified. When the finance and accounting software is implemented at the OAHs and UNDP these organizations will have access to a rich set of reports and diagnostic tools.

262. Successful systems development entails a high degree of user involvement and dedicated participation in confirming specifications, user system testing and in loading data into the new system. In light of the organizational circumstances concerning the availability of knowledgeable substantive resources, the UN failed to provide adequate substantive expertise to focus on articulating the requirements and specifications. When the various software releases were delivered by the Prime Contractor it was found that in many aspects the computer systems did not function as required. Significant expenditures were incurred in making changes to the software to make it acceptable and delays in implementation resulted. We view what happened with IMIS as a quite expensive prototyping exercise, in which the contractor developed a system in conformity with agreed-upon requirements and specifications which had been approved as correct by the UN, and which subsequently were found by the UN to be substantially functionally inadequate when the contractor delivered the software (this is not unusual in the systems development industry).

263. Some IMIS users take the position that IMIS does not support the reform process, that it automated the old business practices. In our view, there was a disconnect between the substantive offices and the IMIS project concerning who was to spearhead reforms in administrative and business processes. We suggest that it was and is not for the IMIS project to do the reform of administrative and business processes. Such substantive business re-engineering and process reform must be championed, driven and engineered by the offices of interest. It is something for substantive specialists and change management facilitators to do, with the computer systems specialists providing advice and assistance as required. The computer specialists should be involved in the reform process by advising on how technologies can be used to advantage to support advocated business processes reform options, and, to design procure or develop the required systems when funded. What happened with IMIS is that the computer system development went ahead without the offices of interest undertaking major substantive business reforms or business process re-engineering. However, the IMIS design introduced some business

changes (see Annex IV). Our recommendations for IMIS maintenance address the needs for methods and procedures specialists to be part of the substantive offices. These specialists would work on the redesign of business processes and would translate the changes into systems requirements and specifications for submission to the IMIS project team.

264. As detailed in chapter 4, the UN does not have an adequate data communications infrastructure in place to meet the needs of IMIS. UNDP and UNICEF have a service provider in place to meet their own specific requirements. The Organization has not planned adequately to have a data communications capability in place to facilitate the exchanges of IMIS and other data amongst Headquarters, the OAHs and the client organizations serviced by the OAHs.

265. In chapter 3 we have described the difficult implementation and the present ineffective use of IMIS for human resources management at Headquarters as opposed to the potential offered. In our opinion, OHRM did not provide the leadership required to ensure a timely and successful implementation of the IMIS human resources management release at Headquarters. Management focus and attention on proactively dealing with the impact of IMIS on OHRM and the need to assume leadership in the management of change brought about by IMIS appears to have been and to remain missing. Within the Office IMIS is widely viewed as an inconvenience rather than an opportunity. The Office has not assumed or taken the necessary degree of ownership of IMIS which we would have expected and has not become a major champion of the project. We do not ascertain that there are cohesive planning and management processes in place within the Office to use IMIS as a platform for more efficient and effective human resources management processes and operations at the UN.

6.2 Recommendations

6.2.1 Implementation of IMIS at OAHs

266. The most critical and challenging issue facing the UN Secretariat concerning IMIS is to attain an acceptable implementation of most of the IMIS system at the OAHs in 1999. As described in chapter 3 this goal requires the installation of Release 3 at all OAHs in one year, and Releases 4 and 5 to the extent possible in that same period. Many of the existing legacy systems at the OAHs are non-compliant for processing in the Year 2000. It had always been the management expectation that IMIS would be installed fully with finance, support services, entitlements and payroll processing before the end of 1999, thereby mitigating the Year 2000 threat.

267. It is our opinion that there is a high risk that the objective will not be met with the current levels of funding and resources assigned and planned. Paramount is the lack of identified resources and detailed implementation plans for each OAH. Past experiences of implementations at headquarters are a good indicator of problems which will most likely be encountered. All implementations have slipped, partially because of data conversion/cleansing problems and the lack of knowledgeable resources (see the lessons learned section preceding).

268. A new release of the financial software will be implemented in Headquarters at the end of 1998. When the integrity of that software is approved by the Conptroller, the software will be released for use in the OAHs. The OAHs will have software which acceptably meets the UN accounting specifications. The financial implementation, with software which is functionally adequate and with a rich set of reports and diagnostic tools, is being made in the middle of or further into a biennium. This will compound the difficulties as many financial data for the biennium to-date will have to be converted to IMIS (in New York the implementation was four months into a biennium).

269. Conversion and bridging programs have to be written and tested on an individual basis at each OAH. We have not seen detailed plans and schedules giving specific work plans for each OAH. We are not assured that the OAHs are prepared for this level of change. The IMIS project team plans to recruit accountants to support the implementation at each OAH. These accountants will be trained in accounting operations in New York and will then be assigned to support implementation at the OAHs.

270. Our opinion is that expectations for a relatively smooth implementation at each OAH is overly optimistic. Each OAH is a separate operating entity with its own distinct in situe mission, styles of operation, management culture, information technologies competencies, level of expectations for IMIS, and level of preparedness and readiness for IMIS. OAHs also vary widely in organization structure and administrative, human resources management and accounting work loads. Our experience in systems implementation leads us to advise that the likelihood of a successful implementation at any OAH will be increased significantly if, firstly, the implementation plan is cooperatively produced by the OAH itself with the informed technical assistance and guidance of the IMIS project team, and, secondly, the senior management team at the OAH is fully committed to the plan and its execution.

271. Our assessment is that the complete and successful implementation of the finance release at an OAH will be in the range of three through five months, subject to there being sufficient knowledgeable staff dedicated full-time to working on the implementation. Another factor to be considered is that a large OAH such as Geneva processes the payroll for several UN organizations.

272. Payroll can only be implemented at an OAH after the Finance module is successfully implemented. As in New York, parallel runs and/or repetitive processing cycles must be performed in the testing. As stated immediately preceding, there is a risk of slippage in the implementation of finance at every OAH. The next major risk associated with the implementation of payroll is possible slippage in the delivery of the software by the contractor. As all other major software releases have experienced such slippages it is reasonable to make provision for the same to occur with payroll. The next major risk is that the specifications for payroll processing do not exactly suit the local conditions. Although there has been extensive consultation between the IMIS project team and the OAHs on the functional specifications, there is a residual likelihood that the OAHs have not fully articulated their requirements concerning local conditions for the payment of staff members.

273. Our assessment is that the complete and successful implementation of the payroll release at an OAH will be in the range of two through four months, subject to there being sufficient knowledgeable staff dedicated full-time to working on the implementation.

274. We conclude that the implementation of finance and possibly payroll at the OAHs before the Year 2000 is a major activity for which the OAHs and the UN are insufficiently prepared. In our opinion, some OAHs will fail to successfully implement the IMIS payroll release in 1999.

RECOMMENDATION 1

275. The OAHs should make the existing legacy payroll systems Year 2000 compliant.

RECOMMENDATION 2

276. An IMIS Implementation Project Manager should be immediately appointed to focus on the detailed planning, scheduling, coordination and monitoring of IMIS implementation activities at OAHs. This person will be required to travel frequently to the OAHs to manage the implementation.

RECOMMENDATION 3

277. The OAHs, in consultation with the IMIS Implementation Project Manager and the IMIS project team, must prepare a detailed work plan with scheduled resource and funding requirements for the completion of implementation of IMIS, and for a sustainable IMIS operations and coordination capability thereafter.

RECOMMENDATION 4

278. Accounting and systems implementation resources must be identified and/or recruited with some urgency and trained by the involved substantive offices and the IMIS project team to work on the implementation at OAHs.

6.2.2 Long Term Maintenance

279. In chapter 5 we have covered the scope of IMIS sustainment activities as part of the overall responsibility of the substantive Offices and have suggested guidelines for determining the staffing levels required for the operation and use of IMIS within the UN Secretariat units and for the OAHs. Each office or unit must prepare and effect staffing plans to meet its own substantive responsibilities and requirements for the operation, maintenance, continued development, sustainment and use of IMIS within their substantive theatre and for the appropriate management of those responsibilities.

280. The absolute definition of an appropriate long-term maintenance unit for IMIS cannot be undertaken at the present time, as such a process must be driven by the governance process for IMIS. The maintenance organization must be positioned and resourced to take into account the needs of all partners and stakeholders. In this respect, IMIS has progressed from being solely a UN Secretariat system to being one which is also used by UNDP, ILO and UNICEF. An organizational model for a Central IMIS Maintenance Unit is suggested in chapter 5.

281. A transitional maintenance strategy for the next 18 months has been given in the report body. This details the resources which are required in the IMIS project team to meet the known UN maintenance requirements. Additional funds and resources are required.

RECOMMENDATION 5

282. The transitional maintenance strategy for placing the Central IMIS Maintenance Unit within the IMIS Project Team should be adopted until an Inter-Agency IMIS Governance Framework is in place.

RECOMMENDATION 6

283. The IMIS Project should be jointly funded to undertake the transitional maintenance strategy as detailed in chapter 5 plus any maintenance requirements funded by UNDP, UNICEF or ILO. This includes, as detailed in chapter 2 and particularly in section 5.6.2, a level of up to four contractors may be required to supplement the IMIS team in light of the termination of the activities of the Prime Contractor.

RECOMMENDATION 7

284. Each UN Office and OAH should restructure to meet its own substantive IMIS operational, maintenance and coordination responsibilities as detailed in this report.

6.2.3 Inter-Agency Governance Framework

285. Although the UN Secretariat was formerly the principal sponsor and champion of IMIS, and remains a major player, the participation of UNDP, ILO and UNICEF is recognized and must be formally respected as major players in influencing the future management and directions of IMIS. In chapter 5 we have discussed the need to address the governance issue in order to finalize the long-term maintenance issues for IMIS. Our discussions considered the aspects of several players at the table, the need to ensure that there is a forum for substantive interests amongst the participating agencies to be collectively represented, the immediate urgency due to the pending termination of the Prime Contractor contract with the UN, opportunities for providing a common service in support of announced reforms (such as 'UN House'), and, the need to develop a field office version of IMIS to support multiple agencies and Peacekeeping Operations.

286. In chapter 5 we have suggested in diagrammatic form an organizational option for a long-term IMIS governance framework. This is centred on the notion of a United Nations IMIS Development Centre which operates under the direction of an Inter-Agency Governing Board and in conjunction with substantive Inter-Agency Advisory Groups.

RECOMMENDATION 8

287. The Administration should work with other participating organizations to establish and fund an Inter-Agency Governance Framework for IMIS.

6.2.4 Data Communications

288. As noted previously and elaborated in detail in chapter 4, the Organization still does not have an adequate data communications capability in place to facilitate the exchanges of IMIS data amongst Headquarters, the OAHs and the client organizations serviced by the OAHs. It is of the utmost priority that IMIS production data communications capabilities be in place when the data distribution software release is implemented in May 1999.

289. A strategic alliance or supply arrangement with SITA (as used by UNICEF and UNDP) or a similar established service provider would prove to be advantageous to the UN. Points of delivery are currently at more than 1,200 world-wide locations. The opportunities this affords in light of the possible future global demands for UN assistance and intervention are many.

RECOMMENDATION 9

290. The Administration should proceed with some urgency in providing a production data communications infrastructure for IMIS.

6.2.5 Remote Connectivity in Support of Peacekeeping and Tribunals

291. With the development of activities worldwide, and the increased need of integrated databases to provide management with consolidated information on the status of resources and other activities, the reliance on several stand-alone systems at each peacekeeping mission has become insufficient. In addition, there is a growing need for allowing small locations to update data in a centralised system. Currently, there are four separate systems at each peacekeeping mission. The tribunals are also trying to find solutions to their needs and small offices being installed at various duty stations away from the main duty stations (e.g. Bonn) cannot be provided with adequate system support.

292. The porting of IMIS to the WEB or the use of other remote access technologies would also be of interest to IMIS user organizations that are more field oriented. UNDP has a similar need, ILO has expressed great interest in this project and other agencies might become more interested

in IMIS should this solution be available.

293. The deployment of IMIS as such to peacekeeping and/or small missions and/or tribunals is not viable due to its technological requirements and "would be" operational costs. The technology for the remote accessing of systems through the WEB and other technologies has progressed very rapidly over the past 12-18 months. The benefits which will accrue from the successful development of this capability are detailed in chapter 4.

RECOMMENDATION 10

294. The Member States should approve funding expenditures for the development of a remote connectivity capability in IMIS to support Peacekeeping Operations, Tribunals, and the operations of other interested agencies.

6.2.6 UN Secretariat IMIS Management Process

295. IMIS is more than a computer system. For each user organization it is more importantly a mission critical system which is accessible by authorized users and must be managed and maintained accordingly.

296. Now that IMIS is moving towards the end of the primary development phase, when it is implemented in the year 2000 at all OAHs, the management process for IMIS within the UN Secretariat warrants revisiting. The integrated nature of the database design results in a new distribution of the locus of the input of substantive data. The new reality is that many data formerly entered by the Offices into their legacy systems will now be entered elsewhere in the organization.

297. In our view, substantive offices must take ownership and responsibility for ensuring that their substantive data is complete, accurate and timely, irrespective of which organizational units are involved in the collection, input and usage of the data. And, they must champion and prepare justifiable plans related to their substantive responsibilities for IMIS maintenance, operations and development. Ownership and accountability for the successful use of IMIS must be shared between the technical developers and the substantive authorities.

RECOMMENDATION 11

298. The substantive IMIS status and plans, as articulated by each Office of the UN Secretariat and other IMIS user organizations, should be presented in the next IMIS progress report to the General Assembly.

Annex I

Study Consultations

Annex I

IMIS Independent Experts Study
Schedule of Consultations and Presentations

IMIS	*presentation*	*security* *reference tables*
IMIS	*presentation*	*human resources* *roster and skills*
OHRM	Chief, Human Resources Planning and Management Information Service	
DM	Director, Management Policy Office	
IMIS	Chief, IMIS Team Leaders	
OPPBA	Director, Accounts Division	
IMIS	*presentation*	*finance*
IMIS	*presentation*	*support services and integration with finance* *Reality, requisitions and travel*
IMIS	*presentation*	*payments and disbursements*
IMIS	Partners, Prime Contractor	
OHRM	Deputy Director, Operational Services Division	
IMIS	*presentation*	*payroll*
UNDP	Assistant Administrator, Bureau for Financial and Administrative Affairs Chief, Information Systems Division	
OIOS	Inspector General Director, Audit and Management Consulting Division	
ITSD & ICC	Acting Director Director	
Treasury	Treasurer	

ITSD	Chief, Computing Technology Service
OHRM	Director, Operational Services Division
ITSD	OIC, Network Services Section
IMIS	*presentation technical design* *operations*
DPKO	Assistant Secretary-General for Planning and Support
group consultation with direct users of IMIS	OHRM, Operational Services Division OPPBA/Payroll EO, Department of Economic and Social Affairs EO, Office of the Secretary-General OPPBA/PK Finance FALD Human Resources Admin Officer, Iraqi Program Admin Officer, Office of Legal Affairs
IMIS	*presentation IRFA reporting*
OHRM	Director, Special Services
DM	Under-Secretary-General
OCSS	Assistant Secretary-General
OHRM	Chief, Compensation and Special Services
UNICEF	CIO and Director, Information Technology Division
OPPBA	Assistant Secretary General
IMIS Steering Committee	*presentation by expert consultants on study findings*
UNDP	Chief, Information Systems Division Head, Department of Information Management

UNDP	Assistant Administrator, Bureau of Planning and Resources Organization Deputy Director, Office of Human Resources Head, Department of Information Management
ITSD	Chief, Telecommunications Service Telecommunications Engineer, Telecommunications Service
ICC	Director
UNICEF	Chief, Application Development Section

Annex II

IMIS Project Team: Specialties and Expertise

IMIS Project Team Specialties and Expertise

Level	Title	Focus/Specialty/Expertise
D1	Chief of IMIS Project	
P5	Chief, Analysis and Programming	Data Base Architect
P3	Programmer/Analyst	Human Resources/Payroll
P3	Programmer /Analyst	Batch processes/Diagnostics
P3	Programmer /Analyst	Entitlements and batch processes (expert system)
P3	Programmer/Analyst	Procurement (including interfaces)/Finance
P3	Programmer/Analyst	Travel/Human Resources
P2	Programmer	Batch processes/Testing co-ordination
P3	Programmer/Analyst	Interfaces
P5	Co-ordinator	Finance
P4	Analyst	Finance and Travel/Posting rules
P3	Programmer/Analyst	Finance
P4	Analyst	Finance/Interfaces
P5	Co-ordinator	Human Resources and Support Services
P4	Analyst	Support Services
P4	Analyst	Human Resources/Entitlements
P3	Programmer/Analyst	Human Resources/Entitlements
P5	Co-ordinator	Treasury/Technical Co-operation/Payroll
P4	Analyst	Treasury/EDI
P3	Programmer/Analyst	Technical Co-operation/TC related HR
P5	Chief, Technical Support	Configuration Mgnt, Research and Development, Data Base Mgnt, Reports
P4	Data Base Administrator	Development and production support
P4	Configuration Manager	Development support/research
P3	UNIX Administrator	Development support/ research
P2	Programmer	Users support/WEB/Testing
P3	Table Administrator	Data Distribution/Reporting
P3	Team Leader	IMIS Reporting Facility
P3	Data Base Administrator	Reporting data bases development
GS	Programmer Assistant	Reporting
GS	Programmer Assistant	Reporting
GS	LAN Administrator	LAN support and operations
P4	Co-ordinator	Payroll Development
P3	Programmer/Analyst	Payroll development
P5	Co-ordinator	Implementation at Offices Away from Headquarters
GS	Office Assistant	
GS	Office Assistant	
GS	Office Assistant	

Annex III

Documents Processed Volumes
June 1998

Documents processed in IMIS in June 1998

Personnel Actions	2466 approved

Financial Documents Processed	Total
Allotment Advice	529
Bank Reconciliation	154
Billing	181
Blanket PO	73
Blanket Requisition	14
Cash Transfer Document	16
Cash/Cheque	1017
Compensation Claim	31
Consultant /Individual Contractor Agmt	105
Contribution/Pledge	72
Credit Memo	5
Dental Insurance	1
Deposits	589
Education Grant Advance	43
Education Grant Claim	89
Fellowship Stipend	2
Fellowship and Study Tour	2
General Reservation of Funds	405
Imprest/Petty Cash Advance	5
Imprest/Petty Cash Claim	5
Insurance Payment	20
Inter-Office	6
Inter-Office Charges	72
Inter-agency Request	27
Interfund Advance/Loan	4
Interfund Settlement	154
Invoice	1840
Journal Voucher	1178
Letter of Authorization	25
Library PO	9
Library Requisition	9

Life Insurance	4
Low-Value Item	166
Lump Sum Payment	214
Manual Payroll	272
Medical Insurance	29
Miscellaneous Obligation(MOD)	419
Notification Letter	21
Pension Fund	1
Purchase Order for Goods	215
Purchase Order for Services	118
Refund Ticket	1
Reimbursement for Overpayment	50
Remittance	126
Repatriation Claim	4
Request for Contractor	124
Request for Fellowship and Study Tour	1
Requisition for Goods	248
Requisition for Services	195
Return Advance from Others	409
Revenue Refund	32
SSA Claim	218
Salary Advance	266
Salary Overpayment	106
Shipment Payment	41
Stock Requisition	363
Suballotment	10
Third Party Advance	8
Ticket Payment	59
Travel Advance	564
Travel Request (travel+shipment)	1937
Travel Voucher	627
UNDP/TC Billing	529
Vendor Advance	8
Total Financial Documents	**14067**

Annex IV

Substantive Benefits and Improvements Realized

Annex IV

Substantive Benefits and Improvements Realized

as referenced at Section 3.1.6

Accounting Operations

Creation and introduction of a unique chart of accounts; previously there were three separate charts of accounts; these were 50 years old.

Simplification, reduction and automation of posting rules.

Automated funds sufficiency checks providing funds control.

On-line and up-to-date status of funds provided by IMIS.

Real time update of the ledgers i.e. previously the complete update took several weeks with risks of errors.

Elimination of duplicate data entry; all data required in the financial area, such as allotment accounts, etc. is input once only.

Account codes for receivables were standardized and significantly reduced; previously there were many thousand unique account codes while now there are a only a few dozen as IMIS takes full advantage of the capabilities of a relational data base.

Elimination of double verification; for example when obligations come in from Reality (for procurement), or for travel advances.

Capability to process accounts on two different bases of accounting. UN records and processes accounts on a full accrual accounting basis. UNDP records and processes accounts on a modified cash basis; a cash accounting basis is generally used, but interest is reported using the accrual basis. These two different accounting principles are programmed into IMIS accounting logic. This affords the opportunity for any member organization of the UN system to adopt the IMIS accounting application with little modification required to the existing computer programs.

Treasury

Introduction of modern technologies that greatly improved the security for the issuance of checks.

Introduction of the concept of aged payables (never existed before) permits Treasury to schedule payments consistent with cash management requirements.

Periodic revaluation of payables and receivables, a function which was not done effectively in the past.

Payroll Processing

Standardized payroll processing over the UN system, world-wide (e.g. prorating of salary etc. is consistently applied for all duty stations.

Flexibility for the payroll offices to set-up their particular payroll system as per the specific needs of each duty station (e.g. dynamic pay groups).

Possibility to run the payroll in trial mode, as often as desired, and, the possibility to run an ad-hoc payroll whenever required.

Elimination of duplication of data entry of all human resources data, currently re-entered in the payroll system.

Automatic distribution of payroll reference tables through IMIS to all duty stations and users worldwide; previously they re-entered the data at each location

Creation of the first database of rental applications; previously, only the financial implications of the rental applications were stored in the payroll mainframe system.

Time & Attendance

Creation of the first UN-wide system for the recording of attendance and its integrated use in the processing of payroll.

Electronic workflow with the Medical Service, which improves the efficiency/time-lags associated with sick leave administration.

Insurance

Direct access to the human resources data for staff members, thus eliminating duplication of data entry.

Human Resources Management

Integrated post management and job classification.

Ability to track the status of prseonnel actions on-line.

Ability to view on-line the up-to-date status of the appointment of staff.

Creation of the first data base of dependents.

Decentralization of the approval function of personnel actions to Executive Offices made possible by edits and validations and flexible security in IMIS.

Data clean up; human resources records have been validated and corrected, thereby assuring the more accurate provision of management information; the clean up was precipitated by the rigorous data validation edits included in IMIS.

Consistency in the application of entitlements throughout all duty stations.

Integrated staffing-control table.

Integrated capability to record the skills of serving staff.

Education Grant processing fully automated and integrated with human resources and finance (advances and disbursements) applications.

Travel

Streamlining of the travel process with electronic queuing, eliminating several process steps.

Electronic queueing of the travel request form to the travel office from Executive Offices and Accounting; eliminates steps.

Ability to track status of travel documents on-line (also relates to other pre-encumbrance, obligation and payment document types) as former paper based documents have been replaced by electronic documents.

Ability to duplicate travel requests (ie use a template) to assist in processing large numbers of travellers with similar itineraries travelling to conferences.

$1,000 tolerance between pre-encumbrance/obligation and obligation/payment for travel to avoid numerous small amendments being processed (a similar tolerance is being introduced for other pre-encumbrance/obligation document types).

Integration of Human Resources, Travel and Finance applications.

Procurement

On-line catalogue for commonly procured items.

Interchange of data between IMIS and the procurement system to eliminate double entry of the data.

Consolidation of the vendors data (Finance, Library, Procurement); previously data was held in various places and was often duplicated.

Improvement of the low value procurement process (low value documents up to $2,500 for goods and services).

UN Global Technology Infrastructures

Upgrade of the duty-station infrastructures accelerated the introduction of IMIS and the inherent need for user connectivities to accommodate IMIS access and usage.

Introduction of new technologies worldwide.

Annex V

Production IMIS Upgrade Report
July 1998

Context

To illustrate the nature and technical complexities of an interim release, this annex is the production upgrade report which was issued to IMIS users with the implementation of a software enhancement release in July 1998. This shows the wide range of enhancements which were then implemented in response to user requests for enhancements, and, the identification of programming logic errors and problems with application functionalities.

Annex V

UNITED NATIONS - INTEGRATED MANAGEMENT INFORMATION SYSTEM
PRODUCTION IMIS UPGRADE REPORT
For Users - 15th July 1998

AD - Accounts
TRS - Treasury
TVL - Travel
EO - EO, FALD, Liaison offices
PD - Procurement Division

ASHI - AD
TPR 580-3-p: ASHI/IMIS Interface
Problem: Changes to the interface is necessary in order to provide a more accurate financial position of the accounts coupled with a less burdensome reconciliation process.
Solution: The change to the ASHI interface includes elimination of posting of various offsetting credits, elimination/creation/adjustment of various receivables and creation of journal vouchers.

Receivables Enhancement - AD
TPR 724-3-p: Posting rule changes for receivables
Problem: Users needs ability to approve and cancel certain prior period receivable documents.
Solution: Added posting rules to IMIS. Now users can approve and cancel following prior period documents: Billing, Contribution/Pledge, Contribution/Pledge In Kind, Notification Letter, and Tax Overpayment.

IOV Bridge - AD
TPR 904-3-p: IOV Expenditure/Revenue Bridge
Problem: The IOV Expenditure/Revenue bridge does not create no line numbers for the JNLV lines when it posts to account ledger.
Solution: Enhanced bridge will transfer Technical Cooperation Expenditures from Other Duty Stations into IMIS as approved Journal Vouchers with line information.

Disbursement/Check Printing Interface - TRS/TVL
TPR 905-3-p: Print remittance advice for travel claim cheques
Enhancement: This enhancement allows printing of remittance advice for travel claim cheques showing name and address of payee, originating document details and issued cheque

Applied Deposit - AD
TPR 915-3-p: Prior period rules required for Applied Deposit
Problem: prior posting needed for many of Normal and Inter-office Applied Deposit documents.
Solution: Users are now allowed to approve and cancel following documents.

Approve	Remittance, Imprest Petty Cash Collection, Advances for Allocations, Investment, Advances from Others, Cash Transfer, Interfund Settlement, and Overpayment
Cancel	Deferred Income, Remittances, Imprest Petty Cash Collection, Advances for Allocations, Investment, Advances from Others, Cash Transfer, Interfund Settlement, Overpayments, InterofficeCollection, Income and Expenditure.

ASHI - AD

TPR 941-3-i : 11-05-27 ASHI interface must segregate medical-dental

Problem: ASHI Interface does not segregate medical and dental info requiring users for manual work around using Journal Voucher.

Solution: Posting rules and ASHI interface were changed to accommodate different type of payable by coverage type.

Advances - AD

TPR 973-3-p Prior period posting for advances

Problem: Users cannot cancel prior period Advance documents.

Solution: Posting rules have been modified. Now users can cancel (but not create) prior period all Advances documents.

Not for users

TPR 1010-3-p: Change description of EGAJ admin event

Changed description of admin event 'EGAJ' to 'Void Education Grant'. It had been changed already in the database. This is mostly for future installations.

Not for users

TPR 1020-3-p: Various performance enhancements to the IMIS database

Created and retired appropriate indexes on IMIS tables. Made changes to query stored procedures to enable them to make better use of available indicies.

Travel Request - TVL

TPR 1024-3-p: The error message "Entry Required for Blank Field" is displayed during "Save" action for a travel request with zero Insurance line amount.

Problem: When a Shipment Line with insurance is created and the "Entitled Amount" for insurance is entered the insurance "Pending Amount" cannot be left blank. However, the error message should be displayed on the "Shipment" screen and not upon "Save" action.

New Functionality: The standard message "ERROR: Entry is Required " is displayed when "Entitled Value" for insurance is not blank but the "Pending Amount" for insurance is blank and the user clicks on OK button.

Payment Request - AD

TPR 1026-3-p: Unable to associate to fellowship obligations

Problem: Users were unable to associate "Fellowship and Study Tour" obligations to "Fellowship Stipend" payment requests because the obligation document type on the "Select Associate Obligation" screen was incorrectly defaulted to "Library PO".

Solution: For "Fellowship Stipend" payment requests, the obligation document type on the "Select Associate Obligation" screen is now defaulted to "Fellowship and Study Tour".

This is rel 1 tpr

TPR 1027-3-p: No response from Actions

Rel. 1 bug fix. Fix a problem that was introduced into Rel. 1 menu processing as a result of code changes for the new Mobility user session.

Obligation - EO

TPR 1031-3-p: Option Menu Item Problems in Obligation

Problem: Print/Maintain Delivery Instruction/Payee Detail Options of obligation documents does not function properly.

Solution: Individual Consultant/Contractor Agreement Obligation documents are now printable in any status (e.g., Unapproved, Approved, etc.). All other printable obligation documents should be printable only in the approved status in the Inquire mode. For Purchase Orders for Low Value Goods and Purchase Orders for Low Value Services, Maintain Delivery Instructions under Options should be available and have a default and changeable address. All other obligation document types should have this Option available, but should be blank. Also, Payee Details should be available under Options for Purchase Orders for Low Value Goods and Purchase Order for Low Value Services, however this option should not be available for the other document types.

Journal Voucher - AD

TPR 1035-3-p: Incorrect posting of Journal Voucher Documents

Problem: When approving or canceling a Journal Voucher that was not an IOV document, just after having an IOV Journal Voucher on the screen, the IOV fields in SLDE would be populated with the incorrect information from the IOV JV, instead of being empty.

Solution: Incorrect IOV information is no longer recorded.

Project/Mission Accounting Reference - AD TC

TPR 1038-3-p: Incorrect Region value populated from F1 lookup

Problem: The Region value populated from the F1 lookup in the Project/Mission Accounting Reference user session is not written in the database (proj.tbl) correctly.

Solution: The region value is now stored onto database correctly.

Reality Interface/Powermodel - PD

TPR 1040-3-p: Reality PO bridge - PowerModel interaction

Problem: Reality Purchase Order interface crashes with PowerModel and leaves unapproved documents and records in IMIS database.

Solution: To prevent crashing, change the PO bridge to exit from PK after each input file is processed and restart PK for new input file. The interface no longer crashes.

DSA Interface - Not for user

TPR 1041-3-p: DSA interface sp correction

Problem: A stored procedure in the interface is looking for step information which was unnecessary.

Solution: The stored procedure was modified to look for Grade/level information. It no longer look for step information.

Release 1

TPR 1216-3-i: New Multiple Post Management user session

The new user session Multiple Post Management allows the creation, modification, modification of funding, extension and abolishment of posts in bulk. The new user session enhances the functionality provided by the existing post management user session, when processing the same standard modifications for the same set of posts. More exceptional processing like freeze or loan post will still be processed by the regular post management user session. The functionality for the new user session is only available for the UN, and not for other sites (UNDP, UNICEF, ILO). The enhancement also adds BIS post number and post budget account classification elements as additional search criteria on the commonly used Post selection screen.

Not for end users

TPR 5037-3-u: Syntax error in 'if exists' statement

Corrected a syntax error in the stored procedure which caused confusing warning messages to appear during the IMIS installation process.

Not for end users

TPR 5038-3-u: Add URCA to Major Duty Station Table

Add one row of data (UNCA 'MUNURCA Misn Ctrl Africa') to the major_duty_station dat file mdst.dat.

Not for end users

TPR 5039-3-u: Refresh Recruitment Allowance Table

Refresh Recruitment Allowance Table (reca) with new data for IMIS 2V2 Entitlements implementation.

Not for end users

TPR 5040-3-u: General updates to production utilities

Added functionality to handle execution of conversion programs, setup of training databases, setting of values in the site table, etc. Changed 'instgrid.cfg' which will be part of the cmt process.

Not for end users
TPR 5042-3-u: Recr Allow-Modify ASG & USG allow_amt

Modify Recruitment Allowance Table (reca) for ASG and USG allowance amounts.

Not for end users
TPR 5043-3-u: Add Budget Lines 6103, 4-Mod Budget Line Desc 6101,2,5

Modify Budget Line Table (budj) to add budget lines 6103/6104 and modify budget line description for budget lines 6101/6102/6105.

Payment Request - AD
TPR 5044-3-u: Incorrect posts for credit memo
Problem: There is no current posting rule for Credit Memo with object code of revenue.
Solution: User can create and cancel current period Credit Memo with object code of revenue for all fund types except TC.

Not for end users
TPR 5057-3-u : Dat files need to allow for horizontal partitioning

Not for end users
TPR 5058-3-u: Add UNPS to Major Duty Station table.

It covers the addition of one row of data (UNPS 'UN Political Offc Somalia') to the major_duty_station dat file mdst.dat.

Not for end users
TPR 5065-3-u: sql_in should update extract control when modifying tbl

Added code to update Audit Log Header value to 0 whenever the data is thrown away for a specific extract.

Travel -

Travel Claim
TPR: 981-3-p: Posting for Refund Ticket and Prior Period Posting of non-obligated lines for canceling travel claim documents.
Problem: (1)The current period posting rules for Refund Ticket documents posted regardless of the object code of BAC. (2)The prior period posting rules did not exist for canceling of non-obligated lines for

Travel Claim documents.
Solution: For (1): The Refund Ticket documents are now posted according to the Object Code in BAC (Expenditure or Revenue). For (2): The user can now cancel prior period Travel Claim documents which have non-obligated lines.

Travel Claim
TPR 1023-3-p: The Amend Travel Request - Certified Travel(Shipment) Details action could not be used for travel requests with "Insufficient funds" status
Problem: If a travel request fails fund sufficiency on approval the status changes to "Cert.. Insufficient Funds" and the document is not available for the "Amend Travel Request - Certified Travel details" (or "Certified Shipment Details") action.
: Travel Requests with the "Cert.. Insufficient Funds" status can be amended using the "Amend Travel Request - Certified Travel (Shipment) Details" action.

Travel Request
TPR 1034-3-p: Cannot save travel request
Problem: Users were unable to save travel requests if one or more of the associated BACs had a serial number greater than 32768. The problem was caused by an incorrect "smallint" parameter in stored procedure up_tr_crt_trva.
Solution: Users are now able to save travel requests irrespective of the value of the serial numbers of its associated BACs.

Travel Request
TPR 5045-3-u : Travel is not printing the Travel Authorization
Problem: Travel Requests with a large account code serial number do not print.
Solution: The database code was modified, so that users can print all Travel Authorization.

Ed Grant

Extracts Not for users

TPR 17-3X-u: Extracts delivery missing important sp

TPR 30-3X-p: Reduce time required to populate docu0_calc_extract

Modification of the PERL script to reduce the time required to populate the docu0_calc_extract and to correct the primary and secondary id's of Travel Requests that were closed and Obligations that do not have a related Pre-Encumbrance .

TPR 32-3X-p: Fix the fdxw_bis_ind on slde0_extract

To populate the fdcw_bis_ind field on slde0_extract with the value from the fdcw0_extract for the period between Nov. 17th and Dec 16th . THIS WAS A ONE TIME DEAL. THE FIX TO slde0_extract IS DONE.

Release 5 not for users

TPR 2-5-s: Part 1 of CMT process - Triggers and Tables

Modification of all reference table triggers to update the ref_control table. Also includes Release 5 tables, stored procedures, and indexes.

TPR 3-5-s: Part 2 of CMT process - ddcmntbr.ksc

Other Not for end users

TPR 7-0-p: Generic TPR for adding documentation to .tbl files

Generic TPR used to add column comment to TBL files. No functional change.

TPR 9-0-i: Ongoing TPR to create new directories in BATCHDIR

A new utility called "perlftp.prl", a perl script that uses an FTP library to wrap up FTP file transfers in a script that has a timeout value. Now instead of inline 'here' documents, perlftp.prl can be used to safely transfer files (or return an error on a timeout condition)

TPR 11-0-p: Bug in salary scale interface.prc file

Emergency migrated previously. The bug was a call to a perl function that does not exist in production. The call was removed as it was duplicate code to begin with.

TPR 12-0-p: Lack of input files creates an error when it shouldn't

Bug fix for salary scale interface (SALD). When no files are present in the input directory an error message is produced when in fact this is not an error condition. Changed the test.

IRFA Report

I New Finance Reports - AD

	REPORT ID CODE	DESCRIPTION
1	ACRCSH01	Travel Advance Due Recovery
2	ACSLDE28	Travel Advance Payable for American Express
3	ACSLDE29	Tax Equalization Income
4	ACSLDE30	Tax Equalization Expenditure

5	ACSLDE32	Tax Equalization Income RECAPS
6	ACSLDE33	Tax Equalization Expenditure RECAPS
7	ACSLDE34	Receivable/Payable Offset Report
8	ACSLDE35	Assessed Contributions Unpaid Schedule for Member States - General Fund (Worksheet)
9	ACSLDE36	UN General Fund Assessed Contributions Unpaid

III New Travel Reports - AD TVL

	REPORT ID CODE	DESCRIPTION
1	TRTVCH01	Summary of Travel Claim Shipments
2	TRTVCH02	Summary & Status of Unpaid Travel Shipments
3	TRTVRQ04	Shipment Details and Percentage Entitlement
4	TRTVRQ03	Travel Unit Statistical Summary Report

IV Modified Finance Report -AD

	REPORT ID CODE	CHANGES
1	ACLDGB10	Fixed script problem when getting objt code description.
2	ACSLDE14	Fixed problem with Org Unit id.
3	ACSLDE27	Removed Budget Section as input form selection; added Org Unit loop only when fund id UNA is selected.
4	ACSLDE07	Major script revision to enhance report processing.

V **Modified Human Resources Reports** -Rel 1

	REPORT ID CODE	CHANGES
1	PNSTFM04	Modified report fonts and fixed page orientation problems.
2	PNSTFM05	Modified report fonts and fixed page orientation problems.

Annex VI

Maintenance Responsibilities

Context

In Section 5.6 we have suggested the institutional maintenance levels which are required for the long-term maintenance of IMIS. This annex provides guidelines for the maintenance responsibilities of staff members in the several units identified in Section 5.6.

Generic functional responsibilities for a Central IMIS Maintenance Unit

Position Title and Unit	Task Responsibility
Chief, IMIS	Reviews & approves Change Requests for Critical Patch and Interim Releases, prepares IMIS software maintenance budget proposals, approves expenditures, identifies and procures technical skills, tools and equipment
Change Control Officer	Administer change control process
Secretary	Provides administrative support to IMIS
Quality Assurance Officer	Develops and administers QA process, procedures and administers independent acceptance testing
Quality Assurance technician	Carries out independent acceptance testing
Release Development & Maintenance Manager	Administers & coordinates IMIS Release development
Finance, Human Resources, Support Services Team Leaders	Responsible for delivery of release components; develop work schedules, assign resources & tasks, and coordinate work of development teams
Systems Analyst	Analyzes technical impact and costs of change requests, analyzes functional specifications and prepares technical specifications to implement approved changes, supervises work of programmers (construct & test), prepares documentation, serves as Software resolver to IMIS Help Desk by analyzing technical fault symptoms and resolving problems in operating IMIS software
Programmer	Codes and tests software changes and changes to on-line help facility and desk procedures
Technical Support Manager	Provides technical support to Development & Maintenance unit, recommends changes in technical infrastructure (operating system, hardware, tools), provides support to IMIS Help Desk

Data Administrator	Coordinates world-wide distributed databases, maintains IMIS data and database administrative polices and procedures, maintains central data dictionary systems, supervises database design & maintenance, monitors world-wide IMIS software and database performance, provides data administration support services for IMIS development and maintenance, authorizes and supervises mass updates based on automated methods, develops and maintains automated and synchronized procedures for accessing distributed data, and develops, tests & implements when needed an automated procedure to restore local IMIS data for remote operation, monitors automated data distribution and data synchronization activities
Database Analyst	Provides database design and analysis services in support of IMIS development and maintenance, test database changes, develops and tests new database extract programs, develops & maintains database tools, data dictionary tools, and data distribution and synchronization tools, develops data edits to facilitate entry of correct data, serves as Database resolver to IMIS Help Desk by providing assistance to correct database errors, by applying automated rules-based database updates and corrections, and by analyzing database problems & errors and by providing technical solutions.
Configuration & Installation Support Manager	Controls software configuration and coordinates distribution of IMIS releases (administers release roll-out), develops Release configurations & installation instructions, supports installation of IMIS releases and fixes, maintains configuration management tool

Configuration Analyst	Tests & documents installation configuration parameters, provides support to Release roll-out, serves as Configuration resolver to IMIS Help Desk by diagnosing, troubleshooting and correcting IMIS installation errors
Systems Administrator	Maintains & administers IMIS software development environment by developing & administering IMIS data and systems back-up and recovery procedures and by developing and administering IMIS physical and systems access security measures and user accounts, supervises tool customization, maintains IMIS software development tools, maintains computer & network operating system, and maintains external products interface, develops and maintains technical specifications for hardware purchases, tests and configures hardware for use as development machines, develops and tests improved network and systems design for IMIS, configure and test (upgrades to and) new network and system operating systems for use with IMIS
Tool Customization Analyst	Adjusts and customizes software tools to work with new releases, serves as IMIS Tool resolver to IMIS Help Desk
Customer Support Manager	Establishes and maintains communication with users, establishes & supports IMIS User Groups, establishes & administers IMIS Help Desk services, monitors trouble calls and change requests, identifies IMIS ad-hoc reports for inclusion in future IMIS releases, administers user training & documentation services
Secretary	Provides administrative support to Customer Support Unit
Report Administrator	Administers IMIS Report Services, coordinates distribution of IMIS report development tools, coordinates schedules for refreshing report databases, administers inventory/clearinghouse of ad-hoc IMIS reports, coordinates user requirements for reports and database extracts

Report Analyst	Develops and tests database extract tools and IMIS report development tools, develops report specifications, designs and supervises construction, testing and documenting IMIS reports, provides technical assistance to users developing ad-hoc reports, serves as IMIS Report resolver to IMIS Help Desk
Report Programmers	Develops, tests, documents and corrects IMIS reports
Tables Administrator	Develops, maintains & provides IMIS tables administration policies and procedures, Coordinates integrated and distributed IMIS Table maintenance schedules, develops & maintains automated distribution & synchronized replication procedures for local and world-wide IMIS table maintenance, and administers table maintenance activities involving table programming
Table Analyst/Programmer	Analyzes IMIS table changes, develops specifications, programs, tests and documents changes to IMIS tables, serves as IMIS Table resolver to IMIS Help Desk by providing technical assistance to correct IMIS table errors
Documentation Administrator	Maintains systems documentation, maintains and distributes user documentation & IMIS training materials
Documentation Analyst	Develops documentation standards and systems, maintains & administers IMIS documentation, reviews and approves system and user documentation, serves as documentation resolver to IMIS Help Desk
Help Desk Coordinator	Administers Problem Management & Resolution System, Coordinates 24 hour/7 days a week IMIS Help Desk Support Services
Help Desk Analyst	Provides 2nd tier IMIS Help and escalation to appropriate IMIS resolver

Generic functional responsibilities for System Administration and Network Support Units

Functional Position	Task Responsibility
Chief, Technological Innovations Services	Manages the Unit
Chief, IMIS Advanced Technology Support	Responsible for IMIS System and Server support and for system security administration
IMIS Server Administration	Test IMIS Release Configurations & Installation instructions, maintain database of IMIS server configuration, install configure, and upgrade production IMIS application and database servers, test & configure new hardware for use as production machines, provide Help Desk Support by providing engineering support to diagnose and correct hardware errors, and IMIS software installation errors, develop and test new network and system designs for IMIS, configure and test server operating systems for use with IMIS
IMIS Systems Administration	Monitor IMIS system performance, maintain IMIS asset inventory database, maintain database of IMIS system parameter configuration, develop & administer IMIS data and system back-up and recovery procedures, conduct regular IMIS data and system back-ups, maintain IMIS network and system design documentation
IMIS Security Administration	Develop & administer security database identifying access rights correlated to administrative responsibilities for UN posts and users, develop and administer procedure for granting IMIS access rights and changes to access rights, develop and administer physical and systems access security measures, administer IMIS user accounts, develop & implement when needed, IMIS disaster recovery plans
Chief, Infrastructure & Application Support	Manages unit

IMIS WAN Support Services	Monitor IMIS network performance, maintain database of IMIS network configuration, install configure and upgrade production networks and internetworks to support the synchronized operation of IMIS in New York and world wide.
IMIS LAN & Desktop Services	Monitor IMIS LAN performance, maintain database of IMIS LAN configuration, install, configure and upgrade production networks and desktops to support the operation of IMIS in New York, develop new workstation and LAN configurations for IMIS, maintain LAN user accounts, test new LAN and desktop hardware for use with IMIS
IMIS Help Desk Services	Provide end-user support for the operation of desktop systems and their applications, including first level IMIS help, open trouble tickets, troubleshoot, escalate to appropriate authority, close trouble tickets

Generic functional responsibilities for Policy and Systems Units (within OHRM, OPPBA, OCSS)

Position	**Proposed Task Responsibility**
Chief, Policy & Systems	Manages the Unit
Policy Coordinator	Develops and administers procedures for granting IMIS access rights and changes to access rights, develops and promulgates policies and procedures for the coordination and supervision of administrative work flows, develops and implements procedures for identifying and considering requests to change IMIS, approves training requests in administrative and desk procedures
Policy Analyst	Analyzes functional fault symptoms, analyses and assesses functional feasibility impacts and benefits of proposed changes, develops functional specifications for approved changes, acceptance tests, tests on-line help facility and procedural changes, monitors and analyzes IMIS outputs and develops forecasts
Systems Coordinator	Coordinates and monitors administrative work flows, provides functional help regarding the operation of IMIS, identifies and assesses user training needs in administrative and desk procedures
IMIS Table Coordinator	Coordinates and supports IMIS table updates within Office
Report Analyst	Develop user requirements for IMIS reports and database extracts
Systems Analysts/Programmer (requires knowledge of Paradox)	Develops, tests and documents ad-hoc IMIS reports

Generic functional responsibilities for Methods and Procedures Unit (within OHRM, OPPBA, OCSS)

Position	**Proposed Task Responsibility**
Chief, Methods & Procedures	Manages the Unit, administers the process of approving and issuing changes to UN administrative procedures, administers the process of translating UN administrative procedures into IMIS functional specifications, administers a process to ensure UN administrative staff are knowledgeable and current in administrative procedures
Procedures Administrator	Issues UN procedures and changes to UN administrative procedures, maintains document management and tracking system containing official documents on UN administrative and financial rules, procedures, functional specifications for IMIS and desk procedures, proposed and draft procedures and their status, maintains database of UN officials and offices to whom to send UN procedures and updates, arbitrates disputes regarding changes to IMIS functionality and operation
Documentation clerk	Documents changes to administrative procedures
Human Resources Coordinator	Administers UN Human Resources Rules, develops and maintains official UN administrative procedures within framework of UN rules, monitors the application of UN administrative procedures and IMIS desk procedures, and identifies training needs, coordinates overall work flows between administrative units

Methodologist/Analysts	Translates UN administrative procedures into IMIS functional specifications and desk procedures, provides functional help to UN staff in following IMIS desk procedures, analyzes functional fault symptoms and resolves problems in operating IMIS software, analyses and assesses functional feasibility, impacts and benefits of change request proposals, develops functional specifications to implement approved changes, participates in acceptance testing, tests help facility and desk procedure changes
Finance & Budget Coordinator	Administers UN Finance and Budget Rules, develops and maintains official UN administrative procedures within framework of UN rules, monitors the application of UN administrative procedures and IMIS desk procedures, and identifies training needs, coordinates overall work flows between administrative units
Methodologist/Analysts	Translates UN administrative procedures into IMIS functional specifications and desk procedures, provides functional help to UN staff in following IMIS desk procedures, analyzes functional fault symptoms and resolves problems in operating IMIS software, analyses and assesses functional feasibility, impacts and benefits of change request proposals, develops functional specifications to implement approved changes, participates in acceptance testing, tests help facility and desk procedure changes
Support Services Coordinator	Administers UN Support Services Rules, develops and maintains official UN administrative procedures within framework of UN rules, monitors the application of UN administrative procedures and IMIS desk procedures, and identifies training needs, coordinates overall work flows between administrative units

Methodologist/Analysts	Translates UN administrative procedures into IMIS functional specifications and desk procedures, provides functional help to UN staff in following IMIS desk procedures, analyzes functional fault symptoms and resolves problems in operating IMIS software, analyses and assesses functional feasibility, impacts and benefits of change request proposals, develops functional specifications to implement approved changes, participates in acceptance testing, tests help facility and desk procedure changes

About the Experts

Curriculum Vitae

Name: **Dr. Miguel Brücher**

Nationalities: Brazilian and German

Graduation: Dr. in Computer Sciences and Mechanical Engineer

Interests:

Information technology, software development methodology, very large data base systems, data security and international co-operation.

Education:

1983-1985 Research Project by the Society for Mathematics and Computer Sciences (Gesellschaft für Mathematik und Datenverarbeitung), Bonn, Germany

1976 Doctorate in Computer Sciences at the University of Munich, Germany

1970 Mechanical Engineering at the Federal University of Rio de Janeiro

Professional Activities:

1975/1998 - SERPRO-Data Processing Company of the Financial Ministry in Brazil. 10,000 employers, annual budget (1998) 700 Million $US. During this time he has developed large database and on-line systems for financial management of the Federal Government, for the registration of all the Brazilian vehicles and to control the import and export of products. For three years (1984/1986) he worked on research projects associated with universities and software/hardware companies. In 1984 he won the first prize with the paper: Methodology for System Development using Petri Nets.

Since 1990, he has been the General Manager for the Electronic Commercialization of Federal Government Information and also heads the international co-operation with the Portuguese speaking African countries and MERCOSUL. In this subject he his leading a project for information systems in financial management for the Republic of Angola, electronic mail (based on INTERNET technology) for the Republic of Cabo Verde and human resources for Republic of Paraguay.

He also participated on the project that introduced the INTERNET in Portuguese speaking countries and has presented several conferences covering: Information Technology, Quality in Data Processing, and, the Global Net and the Technologies.

1975 - SIEMENS AG, in Munich/Germany, where he worked with very large data bases (GOLEM)

1970/1973 - Montreal Engenharia S.A., in Rio de Janeiro where he worked at the electrical engineering department.

1969 - Krauss-Maffei AG in Munich/Germany, here he joined a project on trains with diesel engines.

Academic Positions Held:

1984/1986 -Teacher of Methodology for the Development of Information Systems, at the Catholic University of Petrópolis - UCP, Rio de Janeiro.

1986/1988/1990 - Summer Seminars in Software Experience by the "Escuela Brasileiro Argentina de Informática" - EBAI in Argentina and Brazil.

1992/1994 - University of Marburg, Germany, Seminar on The Integrated Systems for Financial Management in the Brazilian Federal Government.

1997 - Seminar or Software Quality at the University of Buenos Aires in Tandil, Argentina.

Other Positions Held:

Represents SERPRO in diverse Conferences on the themes Technology, Data Processing and Information Technology.

Other Relevant Information:

He has published several papers and articles in conferences and magazines in Brazil and Germany.

Organized seminars and conferences.

COLIN D. WOOLES, M.Sc., M.A., B.Sc., CMC

QUALIFICATIONS:

Academic:	1975	M.A.	Public Administration Carleton University, Ottawa
	1964	M.Sc.Tech	Industrial Administration University of Manchester, UK
	1961	B.Sc.Tech	Honours Physics University of Manchester, UK
Professional:	Certified Management Consultant, CMC Province of Ontario		

PROFESSIONAL PROFILE:

A civil servant with the Federal Government of Canada for 27 years. Managed projects and consulted at a senior level. Thirty years experience of computer systems and information technologies development and operations. Nineteen years experience as a Management Consultant specializing in information systems development, information management strategy and policy, and in general management consulting. Has conducted international assignments and completed numerous assignments in management review and audit and in program evaluation.

SELECTED RELEVANT EXPERIENCE:

1979 to 1998:
Consultant, Government of Canada;
representative assignments and accomplishments include

	United Nations Secretariat	
Expert Consultant	Conducted an independent expert study of the development process and status of IMIS, an integrated information management system in New York and overseas duty stations. Using the results of the assessment, the General Assembly continued funding the systems development. A subsequent engagement advised the Secretariat on implementation readiness and strategic options for implementation.	Management Review

	Government of Malaysia	
Consultant	Developed strategic EDP and organizational plan for the Accountant General to upgrade hardware facilities and applications capabilities at state and district accounting offices	Technologies Planning and Evaluation
Manager/Consultant	Directed user requirements and functional design phases of a major consulting assignment to provide assistance in financial management improvement to the Accountant General of Malaysia	Government Accounting Systems
	Department of National Defence	
Manager	Developed procurement strategies and awarded and managed technical consulting contracts for refit of Canadian destroyers totalling $9 million involving 50 individual consultants; and for like technical consulting services valued at $6 million for the Project Management Office for the upgrade of all military land vehicles communications capabilities.	Project Management
Manager	Managed a team of consultants developing the business case analysis related to the prospective outsourcing of Pay & Pension Calculation Services for the Canadian Military Regular and Reserve Forces. Developed a prospective procurement strategy and prepared a Request for Information document for the solicitation of market interest.	Alternate Service Delivery
	United Nations Special Commission	
Expert Consultant	Advised the United Nations Special Commission on Iraq on an appropriate organization and information technologies for ongoing and future monitoring of compliance with Security Council resolutions	Organization Review

Government of the Philippines

Consultant Advisor	Reviewed plans in the Department of Budget and Management for the introduction of automated processing capabilities for establishment reporting and time reporting and payroll processing in government institutions throughout the country. Advised on the way ahead for seeking consensus with other Government Departments and an approach to the phased roll-out throughout the government as data communications capabilities became available.	Information Management Review and Planning

Department of Foreign Affairs and International Trade

Consultant	Advised on requirements and developed strategy for additional funding for a new assured communications initiative related to the safety of Canadian citizens resident in high risk countries.	Strategic and Operational Planning
Consultant	Undertook an organizational analysis and review to define an appropriate information technology security establishment in light of a global information technology initiative with secure communications linkages to 120 missions.	Organization Review and Audit

Auditor General of Canada

EDP Auditor	Reviewed implementation and effectiveness of the Financial Management System in the Department of Energy, Mines and Resources.	Information Systems Audit

Privy Council Office

Consultant	Conducted a management review and developed a strategy for Information Resources and Information Holdings Management	Information Resources Strategy
Manager	Managed fast-response research contract procurement for two Royal Commissions covering the Transportation Sector involving 80 transportation and legal research studies.	Project Management

Canadian Security Intelligence Service

Managing Consultant	Conducted a post-implementation review of the government's Security Screening Information System. Evaluated the results of the implementation in terms of program service delivery efficiencies realized, the effectiveness of the systems development process, and identified opportunities for further efficiencies through the use of information technologies interfaces with client departments.	Management and Information Technology Review
Consultant	Advised on an acquisition strategy for replacement of and/or enhancements to the department's legacy financial system in light of the government CIO shared systems initiatives and the department's emerging client-server architecture.	Information Technology Planning

Citizenship and Immigration Canada

Consultant	Conducted a high-level management review of an ongoing $165 million Systems Modernization Initiative for this relatively new government department and its linkages to the re-engineering of business processes within the department. Prepared lessons learned for consideration by Senior Officials of the department in light of budgetary restraint	Management Review and Assessment

Department of Fisheries and Oceans

Consultant	Formulated a planning model for the Pacific Salmonid Enhancement project in British Colombia based on the planning elements for the review and evaluation of the economic, environment, socio-economic, employment and Native Peoples accounts; including the collection methods and source databases for populating the model.	Program Evaluation and Strategic Planning
Consultant	Reviewed existing applications and systems under development for the financial accounting and reporting and the materiel and asset management functions in two departments with nation-wide operations which are merged. Developed, in consultation with clients and other stakeholders criteria for the choice of unified systems and strategies for migration and implementation. The recommendations, sensitive to the separate and distinct cultures and disparate technologies of the merged organizations are supported by a business case for proceeding in the recommended direction.	Financial Systems Architecture and Technology Review

1977 to 1979: Census Dissemination Manager, Statistics Canada

Manager	Developed applications software for dissemination of Census data in machine-readable format	Systems Development and Implementation

1972 to 1977: Team Leader, Statistics Canada

Manager	Directed installation and coordination of computer systems development and operation of a network of computer centres in regional offices throughout Canada to support decentralization of the Canada Labour Force Survey operations.	Systems Development and Implementation

1971 to 1972: Manager Computer Services, Canada Post Office

Manager	Managed systems software and hardware planning groups. Developed EDP Strategic Plan.	Systems Development and Implementation

1969 to 1971: Applications Manager, Computel Systems

Manager/ Consultant	Provided applications software support to computer service bureau clients	Applications Software Support

1967 to 1969: MIS Consultant, UNIVAC International

MIS Consultant	For the International Comptroller, developed and implemented financial MIS applications at UNIVAC subsidiaries in North America and Europe	Systems Development and Implementation

1965 to 1967: Systems Analyst, Boeing Company

Systems Analyst	Planned and developed production control and materiel applications systems for Commercial Aeroplane Division, Seattle	Systems Development and Implementation

1964 to 1965: Analyst/Programmer, Ontario Hydro, Canada

Analyst/Programmer	Developed computer programs and user training materials for province-wide materiels inventory and accounting system.	Systems Development